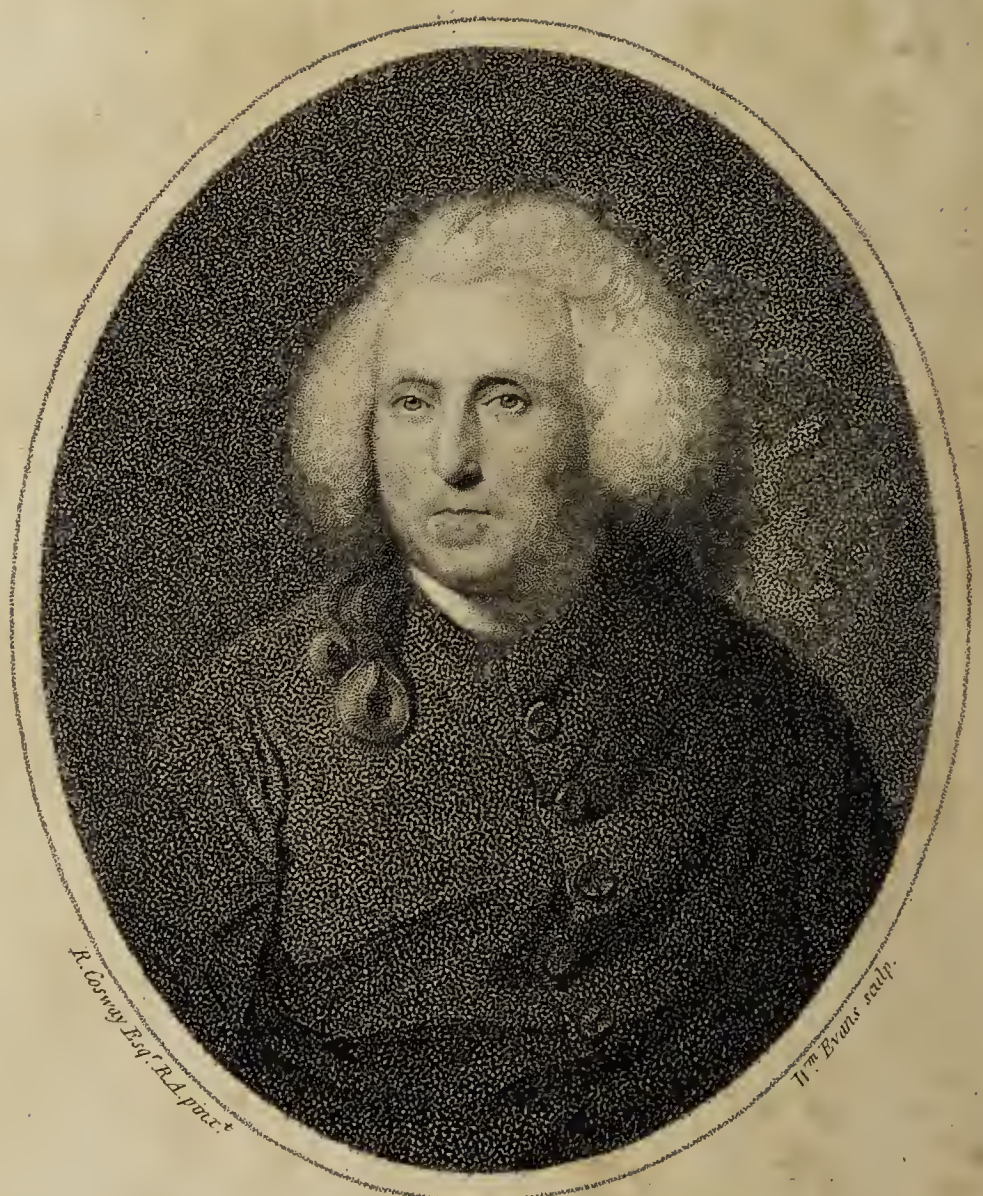
The Marquis of Stafford.



PETER TEMPLEMAN, M.D.

Principal Secretary of the Society for the Encouragement of Arts, Manufactures and Commerce.

Elected March 25. 1760.

Died September 21. 1769.

London, Published as the Act directs, August 1.1799.

16766

TRANSACTIONS

OF THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE

ENCOURAGEMENT

OF

ARTS, MANUFACTURES, and COMMERCE;

WITH THE

PREMIUMS offered in the YEAR 1799.

VOL. XVII.

LONDON:

Printed by W. and C. SPILSBURY, Snow-hill.

To be had, by MEMBERS, of the REGISTER, at the SOCIETY'S HOUSE, in the ADELPHI; and sold by Messrs. ROBSON, J. WHITE, BECKET, JOHNSON, CADELL and DAVIES, ELMSLEY and BREMNER, WALTER, RICHARDSON, DEBRETT, SEWELL, and TAYLOR.

[Price FIVE SHILLINGS.]

M.DCC.XCIX.

WELLCOME
HISTORICAL
MEDICAL
LIBRARY

PREFACE.

AS a juſt and grateful tribute to the memory of their late worthy and learned Secretary, Doctor Peter Templeman, the Society have directed a Print, taken from a picture of him, painted and preſented to the Society by Richard Coſway, Eſq. R. A. to be prefixed as a Frontiſpiece to this Volume of their Tranſactions. The learning and abilities of Dr. Templeman, both as an Author and Editor, are ſo well known to the Public in general, and ſo recogniſed by thoſe of his friends who recollect him, that nothing need appear on thoſe heads; ſuffice it therefore to obſerve, that on the 25th of March, 1760, he was elected principal

Secretary to this Society, being the firſt perſon who enjoyed that title: this ſituation he held, with high reputation to himſelf, and acknowledged credit to the Society, till his death, which happened in the month of September, 1769, much to the regret of all who had the happineſs of his acquaintance, and greatly lamented by the Members of the Society, to which he had ever directed his attention, and continued a laborious and indefatigable officer.

The various articles contained in the following pages are arranged in a manner ſimilar to what has been cuſtomary for ſeveral years paſt, in the Volumes of Tranſactions annually publiſhed by this Society; but it may be proper (as has been uſually done in the Prefaces to theſe Volumes) to point out to the reader thoſe new ſubjects of Reward, which are herein-mentioned, and enumerate thoſe which, though not abſolutely new, yet, from their conſequence to the Agriculture, the Arts, and the Manufactures

tures of the Kingdom, it has been judged proper to increaſe, in hopes of ſo ſtimulating ingenious perſons, as to induce them with more ardour to ſecond the views of the Society, and thus ultimately to benefit themſelves and the Public, which are the ſole views of the Inſtitution.

To begin, therefore, with the Claſs of Agriculture, as being the firſt in the Liſt. Among the Premiums offered under this head, either new or increaſed in value, ſtands firſt, that of making Meadow Hay in wet weather, Claſs 95. It will be found in a ſubſequent Paper, inſerted in the following pages, that Clover, Lucerne, and other ſtrong-ſtalked plants, have been made into Hay, by a particular proceſs, in the Northern Counties, in wet ſeaſons; but the practice has been hitherto not attended to in the South: yet it is hoped, that what will be found in this Volume will be productive of much benefit; and no one will doubt the advantages that would univer-

ſally ariſe, could any eaſy and cheap mode be diſcovered, of preventing the ill effects that are ſo conſtantly felt from wet weather occurring during the Hay Harveſt.—Under Claſs 110, it will be ſeen, that in order to increaſe the number of perſons who may undertake to improve the Waſte Moors in this kingdom, it has been thought proper, this ſeaſon, to offer Rewards for leſs quantities of Land ſo improved than has hitherto been cuſtomary. Under the Claſſes 130 and 131, the former for deſtroying the Fly on Hops, and Caterpillars on Fruit-trees and Culinary plants, and the latter for the cure of the Rot in Sheep, it has been judged right, conſidering the great evils theſe Premiums are intended to alleviate, to increaſe the Rewards offered for attaining thoſe ends; and however it may ſeem a little foreign to the uſual practice of this Society, yet, as on the induſtry of the labouring poor, the Arts, Manufactures, and Commerce of the Country muſt in a great degree depend, the Society have this Seſſion firſt

offered

offered their Gold Medal (ſee Claſſes 135 and 136) to thoſe perſons of rank and opulence who ſhall contribute to the comfort of ſuch labouring poor, by the erection of cottages for their dwellings, and allotting a quantity of land for their accommodation.

Among the Premiums offered for Diſcoveries in Chemiſtry, one will be found (Claſs 179) for a ſubſtitute for Tar: whoever conſiders the various uſes to which this ſubſtance is applied, and how neceſſary it is, both in its liquid and ſolid ſtate (Pitch), particularly in a commercial and naval country like this, will readily acknowledge, that to prevent our being deprived of it, by war or other impediment, care ſhould be taken to find, if poſſible, among ourſelves, ſome ſubſtitute for it. It is therefore without doubt a very proper object of the Society's attention, and they have accordingly offered a very handſome Reward for the obtaining it.

The Premiums under the head of Polite Arts continue much as in the preceding Volume, except that, at Claſs 189, a Premium is now firſt offered for the beſt Baſſo Relievo in Terra Cotta, from that fruitful ſource of claſſical deſigns, the Iliad of Homer, conformably to the Will of the late John Stock, of Hampſtead, Eſq.

Two new Premiums will be found in this Volume, under the head of Mechanicks: the one for a Machine for making Bricks, Claſs 218; the other for a method of heating rooms for the purpoſes of Manufacturers, Claſs 225.

The former of theſe has occupied the attention of many ingenious perſons, but hitherto without the deſired ſucceſs; and as an effectual method of expediting and eaſing the labour of Brick-making has long been conſidered as a deſirable object in that Manufacture, the Society has now been induced thus publicly to offer

a Reward

a Reward for the diſcovering a method of doing it.

The other article, Heating Rooms for the purpoſe of Manufacturers, is not only intended to prevent the accidents of fire, to which the preſent method is liable, but alſo to preſerve the health of the workmen employed, which in ſome caſes may be injured by the fumes ariſing from the Metal Tubes through which the heat, in the mode at preſent generally practiſed, paſſes; and this laſt is an object that has ever been conſidered by the Society as of very great and material importance.

The ſeveral Papers and Communications which form the moſt conſiderable part of this Volume, are herein diſpoſed as uſual, under the different Claſſes to which they belong: and firſt, in Agriculture will be found a full detail, communicated by Nathaniel Kent, Eſq. by permiſſion of His Majeſty, of the farms His Majeſty has lately

lately cauſed to be formed in the Great Park at Windſor; and, as the experiments carried on there are on a large and magnificent ſcale, there is every reaſon to believe the communication will afford much ſatisfaction, and be attended with great advantages. It is with ſome concern the Society find that no ſatisfactory account has this Seſſion been received in claim of any of the Premiums offered for raiſing Timber in this kingdom, an object of great importance at all times, but more particularly ſo at preſent, when ſome of the Northern Kingdoms have ſo encreaſed the duties on exportation as to render the various kinds of Timber, imported from thoſe countries, much higher in price than formerly. It will appear that the culture of Oſiers is making conſiderable progreſs: this is a plant which, under the preſent circumſtances, it is highly neceſſary to attend to, or a very uſeful and ingenious ſet of workmen may ſoon be deprived of employment. The culture of Beans and Wheat in regular ſucceſſion (a practice formerly only

only carried into execution in ſome few counties), but which bids fair to be attended with conſiderable advantages, will be found, by the Papers of Mr. Dudgeon, to be extending to the more diſtant parts of the kingdom, and thus one great object of the Society's attention, the communicating improvements from one part of the country to another, appears to be going on very advantageouſly. The Papers of Mr. Bell and Mr. Fox, prove that conſiderable improvements of Waſte Lands, in very diſtant parts of the kingdom, are taking place, and the manner in which the former of theſe Papers is written, cannot fail being highly ſatisfactory to the reader.

The practical obſervations made on Manures by Mr. Middleton, will throw much light, and give ſome uſeful hints reſpecting a branch of Huſbandry which, though of high importance, has hardly ever been ſufficiently attended to by Gentlemen of real ſcience and experimental knowledge; but

but it is hoped will now attract the notice of thoſe duly qualified, and be proſecuted in ſuch manner as to enable the Farmer to apply to the various Soils ſuch Manure as, with certainty, will anſwer the end propoſed by him.

The Paper by Mr. Foſter, on the comparative culture of Turneps, will afford conſiderable information concerning the cultivating that uſeful root, and ſhew the advantages which, under particular circumſtances, attend the Drill Syſtem, when applied to that plant.

The cultivation of Parſneps for the expreſs purpoſe of feeding Cattle and Sheep, is ſaid to have been long practiſed in Jerſey and Guernſey; and ſome trials by Mr. Budd were rewarded by this Society in the year 1771. The Letters now inſerted, from the Rev. Dr. De Salis, confirm all that has ever been ſaid concerning the utility of that root, for the above purpoſes,

and

and ſhew the advantages ariſing from its ſuſtaining the moſt ſevere froſts of this climate; a circumſtance that cannot be too much attended to by all perſons concerned in fatting or rearing ſtock.

There is inſerted in this Volume, a Paper on the cauſe of Blight on Fruit-trees, by the author of the Diſſertations on Orcharding, printed in ſeveral of the preceding Volumes. As this is a buſineſs of very material importance, it will be highly ſatisfactory to the Society to receive any obſervations that may occur to perſons concerned in Orchards on this intereſting ſubject.

Under the Claſs of Polite Arts, in this Volume, will be found a Paper which may be conſidered as a Supplement to that inſerted in the Sixteenth Volume, on Painting in Oil, in a manner ſimilar to that practiſed in the ancient Venetian School, written by the ſame author, and containing a Proceſs

Proceſs for ſeparating the Mucilage from Linſeed Oil.

Under the ſame head is alſo inſerted a method uſed by Miſs Knights, of hardening Models in Clay, and Caſts in Plaſter, in ſuch manner as to give the former the appearance of Bronze, and the latter the reſemblance of Marble. Some artiſts have long been acquainted with the manner and advantages of hardening Caſts in Plaſter of Paris by means of Wax; but it has not hitherto been commonly practiſed in Models in Clay: although, when well performed, the effect is very beautiful, and the property of reſiſting water, ſo as to admit of waſhing them, is very deſirable, as may be found by examining the Samples remaining in the Repoſitory of the Society. A Paper will alſo be found, under the head of Polite Arts, from Mr. Nicholſon, of Ripon, in Yorkſhire, giving a full account of the method invented by him of producing Lights in Stained Drawings; the effect of

which

which is highly pleaſing, as may be ſeen in a ſpecimen in the Society's Collection.

Among the Mechanical Papers inſerted in the following ſheets, is deſcribed an eaſy and expeditious method of Turning Spheres; which, in the opinion of many ingenious perſons, well informed in matters of that kind, will be highly uſeful to workmen practiſing the art of Turnery, and which is clearly exemplified by ſeveral pieces reſerved in the Society's Collection.

Under this head will alſo be found two plates of an Inſtrument, invented by Mr. John Hynam, of St. Peterſburg, for gauging Cutters for Wheels for Clock and Watch Makers, with the ingenious Author's Letters, and ſome Calculations on the ſubject; but the merits of the whole are more fully ſhewn in a Volume of Calculations adapted to the uſe of the Inſtrument, and preſerved in the Society's Library for public inſpection and uſe.

Under this Claſs is alſo inſerted a Plate of a new-conſtructed Clock, wherein a

Crank

Crank is ſubſtituted in the place of an Eſcapement, which, in the opinion of many highly reſpectable artiſts, bids fair to be of very conſiderable uſe in the valuable art of Clock-making.

Two other plates are alſo to be found in this Volume, under the head of Mechanicks; the one, ſhewing a method of counterbalancing the Ropes in deep Shafts of Mines, &c. of which an accurate Model is reſerved; and the other, exemplifying a means made uſe of for laying Water on Water-Wheels, in an eaſy, ſteady, and advantageous manner. Of how much utility theſe two contrivances muſt be in thoſe works to which they are fitted, is too apparent to require any elucidation.

In conſequence of the Premium offered for forming Plantations of the Bread-Fruit Tree in the Weſt-India Iſlands, the Society have with pleaſure received, during this Seſſion, the Papers contained in this Volume; and, when the great advantages that will

will probably one day accrue to the inhabitants of thoſe Iſlands, from the introduction of that valuable article, are adverted to, it muſt afford high pleaſure to this Society to conſider that the firſt Reward offered for the procuring and conveying the plants to thoſe Iſlands originated in this Society, and was moſt deſervedly beſtowed on Captain Bligh in the year 1794.

Having thus given a ſummary account of the ſeveral articles contained in this Volume, there remains only to ſay, that, notwithſtanding the eſtabliſhment of ſeveral Societies on a plan ſomewhat ſimilar to this, yet ſuch is the preſent ſtate of this Inſtitution, that the ingenious of both ſexes are thus publicly invited to ſubmit their works and inventions to the inſpection of this Society, from whom they may be aſſured they will meet with every attention and encouragement their merit may entitle them to, and thereby inſure to themſelves

ſelves honour and profit in the preſent inſtance, and be authoriſed at a future period to reflect with pleaſure that their names will ſtand recorded to poſterity among thoſe worthies who have contributed to the advancement of the Arts, the Manufactures, and conſequent Commerce of their Country; from whence only can ultimately ariſe the intereſt, the riches, and the permanent glory of the Kingdom.

CONTENTS.

	Page
Preface	
Premiums offered in 1799	1-115
Papers in Agriculture	116
Papers in Polite Arts	281
Papers in Mechanicks	305
Paper in Colonies and Trade	353
Rewards beſtowed	359
Preſents received	368
Catalogue of Models and Machines	373
Liſt of Officers	375
Liſt of Members	379
Index	433

Erratum in the 16th Volume of these Transactions.

In the Plate of Captain William Bolton's new-invented Machine for drawing Bolts in and out of Ships, the Reader is requested to correct a mistake that has arisen in a great degree from the parts being wrong lettered: for the Conductor or Steel Bar, marked in the Plate N, should have been L; and the Bolt with the Male Screw (a) should have been marked (N), and the large Male Screw at the other end of the Bolt omitted.

PREMIUMS

OFFERED BY THE

SOCIETY

INSTITUTED AT LONDON,

FOR THE ENCOURAGEMENT OF

ARTS, MANUFACTURES,

AND

COMMERCE,

IN

THE YEAR M.DCC.XCIX.

TO THE

PUBLIC.

ADELPHI-BUILDINGS,
April 10, 1799.

THE chief objects of the attention of the Society for the encouragement of Arts, Manufactures, and Commerce, in the application of their Rewards, are, ingenuity in the ſeveral branches of the POLITE and LIBERAL ARTS, uſeful Diſcoveries and Improvements in AGRICULTURE, MANUFACTURES, MECHANICKS, and CHEMISTRY, or the laying open any ſuch to the Public; and, in general, all ſuch uſeful Inventions, Diſcoveries, or Improvements (though not mentioned in the Book of Premiums), as may appear to have a tendency to the advantage of Trade and Commerce. The Society therefore, in purſuance of their plan, propoſe to beſtow the following Premiums.

Premiums for Planting and Huſbandry.

Claſs 1. ACORNS. For having ſet, between the firſt of October, 1798, and the firſt of April, 1799, the greateſt quantity of land, not leſs than ten acres, with Acorns, with or without ſeeds, cuttings, or plants of other trees, at the option of the Candidate; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the GOLD MEDAL.

2. For the ſecond greateſt quantity of land, not leſs than five acres, ſet agreeably to the above conditions, the SILVER MEDAL.

CERTIFICATES of ſetting agreeably to the above conditions, and that there are not fewer than three hundred young Oaks on each acre, to be delivered to the Society on or before the firſt Tueſday in November, 1799.

3, 4. The ſame premiums are extended one year further.

CERTI-

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1800.

5, 6. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1801.

7, 8. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1802.

9. RAISING OAKS. To the perſon who ſhall have raiſed, ſince the year 1795, the greateſt number of Oaks, not fewer than five thouſand, either from young plants or acorns, in order to ſecure a ſucceſſion of oak timber in this kingdom; the GOLD MEDAL.

10. For the next greateſt number, not fewer than three thouſand, the SILVER MEDAL.

CERTIFICATES that there were on the land, at leaſt the number of young Oak-trees required, in a thriving condition, two years after the planting, with an account of the methods purſued in making and managing the plantation, to be produced to the Society on or before the firſt Tueſday in January, 1800.

11, 12. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1801.

13, 14. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in January, 1802.

15. ASCERTAINING THE BEST METHOD OF RAISING OAKS. To the perſon who ſhall aſcertain in the beſt manner, by actual experiments, the comparative merits of the different modes of raiſing Oaks for timber, either from acorns ſe

on land properly grubbed and tilled; from acorns ſown at random among buſhes, fern, or other cover; or from young plants, previouſly raiſed in nurſeries, and tranſplanted; regard being had to the expence, growth, and other reſpective advantages of the ſeveral methods; the GOLD MEDAL.

The ACCOUNTS, and proper CERTIFICATES that not leſs than one acre has been cultivated in each mode, to be produced to the Society on or before the firſt Tueſday in November, 1799.

16. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1800.

17. OAK TIMBER IN COMPASS FORMS. To the perſon who ſhall aſcertain, by actual experiments, the beſt method of training young Oaks, ſo as to form Compaſs Timber for Ship-building, the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES of the number of Oak-plants, not fewer than one hundred, that have been trained; and that they promiſe, in the opinion of perſons experienced in ſhip-building, to anſwer the purpoſe intended; to be delivered to the Society on or before the laſt Tueſday in December, 1805.

It is required that with the Certificates there be ſent particular accounts of the age of the trees, when they were begun to be trained, and the methods purſued in training them.

Should any perſon have already engaged in training Oaks for the above purpoſe, any information on the ſubject will be thankfully received by the Society.

18. CHESNUTS. For having ſown or ſet, between the firſt of October, 1798, and the firſt of April, 1799, the greateſt quantity of dry loamy land, not leſs than ſix acres, with Spaniſh Cheſnuts, with or without ſeeds, cuttings, or plants of other

tree

trees adapted to ſuch ſoil, at the option of the Candidate; and for effectually fencing and preſerving the ſame, in order to raiſe timber; the GOLD MEDAL.

19. For the ſecond greateſt quantity, not leſs than four acres, the SILVER MEDAL.

CERTIFICATES of ſowing or ſetting agreeably to the above conditions, and that there are not fewer than three hundred Cheſnut plants, in a thriving ſtate, on each acre, to be delivered to the Society on or before the firſt Tueſday in November, 1799.

20, 21. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1800.

22, 23. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1801.

24, 25. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in November, 1802.

26. ELM. For having planted the greateſt number of the Engliſh Elm, not leſs than eight thouſand, between the twenty-fourth of June, 1797, and the twenty-fourth of June, 1798; and for the having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

27. For the ſecond greateſt number, not leſs than five thouſand, the SILVER MEDAL.

CERTIFICATES of the having planted agreeably to the above conditions, that the plants were in a healthy and thriving ſtate

two

two years at leaſt after making the plantation, and ſpecifying the diſtance of the plants, to be delivered to the Society on or before the firſt Tueſday in April, 1800.

28, 29. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in April, 1801.

30, 31. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in April, 1802.

32, 33. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in April, 1803.

34. LARCH. For having planted out between the twenty-fourth of June, 1796, and the twenty-fourth of June, 1797, the greateſt

greateſt number of Larch-trees, not fewer than five thouſand; and for having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

35. For the next greateſt number, not fewer than three thouſand, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they were in a healthy and thriving ſtate two years at leaſt after they were planted out, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1799.

36, 37. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1800.

38, 39. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1801.

40, 41. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1802.

42, 43. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1803.

N. B. The Larch-trees may be either planted, mixed with other trees, or by themſelves, as may beſt ſuit the convenience of the planter.

44. SILVER FIR. For having planted out, between the twenty-fourth of June, 1795, and the twenty-fourth of June, 1796, in a mixed plantation of foreſt-trees, or ſeparate, according to the option of the Candidate, the greateſt number of Silver Firs,

Firs, not fewer than two thouſand; and for having effectually fenced and preſerved the ſame, in order to raiſe timber; the GOLD MEDAL.

45. For the next greateſt number, not fewer than one thouſand, the SILVER MEDAL.

CERTIFICATES of the number of plants, that they were in a healthy and thriving ſtate two years at leaſt after they were planted out, with a general account of the methods uſed in making the plantation, to be delivered to the Society on or before the laſt Tueſday in December, 1799.

46, 47. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1800.

48, 49. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be produced on or before the laſt Tueſday in December, 1801.

50. OSIERS. To the perſon who ſhall have planted, between the firſt of October, 1798, and the firſt of May, 1799, the greateſt quantity of land, not leſs than five acres, with thoſe kinds of Willows, commonly known by the names of Oſier, Spaniard, New-kind, or French, fit for the purpoſe of baſket-makers, not fewer than twelve thouſand plants on each acre; the GOLD MEDAL, or THIRTY GUINEAS.

51. For the ſecond greateſt quantity of land, not leſs than three acres, the SILVER MEDAL, or TEN GUINEAS.

CERTIFICATES of the planting, and that the plants were in a thriving ſtate five months at leaſt after the planting, to be produced to the Society on or before the laſt Tueſday in November, 1799.

52.

52, 53. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the laſt Tueſday in November, 1800.

54. ALDER. For having planted, in the year 1796, the greateſt number of Alders, not leſs than three thouſand, the GOLD MEDAL.

CERTIFICATES of the number of plants, and that they were in a thriving ſtate two years at leaſt after being planted, to be delivered to the Society on or before the laſt Tueſday in December, 1799.

55. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1800.

56. The ſame premium is extended one year further.

CER-

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1801.

57. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1802.

58. ASH. For having ſown or ſet, in the year 1796, the greateſt quantity of land, not leſs than ſix acres, with Aſh for timber, with or without ſeeds, cuttings, or plants of ſuch other trees as are adapted to the ſoil; the GOLD MEDAL.

59. For the next greateſt quantity, not leſs than four acres, the SILVER MEDAL.

CERTIFICATES of the ſowing or ſetting agreeably to the above conditions; that there are not fewer than one hundred Aſh plants on each acre, in a thriving and

healthy condition, two years at leaſt after the ſowing or ſetting, with a general account of the methods uſed in making the plantation; to be delivered to the Society on or before the laſt Tueſday in December, 1799.

60, 61. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1800.

62, 63. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1801.

64, 65. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1802.

66,

66, 67. The ſame premiums are extended one year further.

CERTIFICATES to be delivered on or before the laſt Tueſday in December, 1803.

68. TIMBER TREES. To the perſon who ſhall have encloſed, planted, or ſown, the greateſt number of acres, not leſs than ten, with the beſt ſorts of Foreſt-trees, adapted to the ſoil, for timber, between the firſt of October, 1795, and the firſt of May, 1797; the GOLD MEDAL.

An account of the methods uſed in making the plantations, and of the nature of the ſoil, together with proper CERTIFICATES that the trees were in a thriving and healthy ſtate two years at leaſt after making the plantation, to be delivered to the Society on or before the firſt Tueſday in November, 1799.

69. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1800.

70. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1801.

71. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in November, 1802.

N. B. With the above Foreſt-trees, the ſeeds, cuttings, or plants, of ſuch other trees as are adapted to the ſoil, and proper for underwood, may or may not be intermixed.

72. PLANTING ORCHARDS. To the perſon who ſhall plant an Orchard after the month of Auguſt in the year 1796, in the

the moſt judicious manner, not leſs than four acres; the GOLD MEDAL, or FIFTY GUINEAS.

73. For the next in merit, the SILVER MEDAL, or THIRTY GUINEAS.

The proof of the value of the improvement of the Orchard ſhall depend on the clear product of the greateſt quantity of fine marketable fruit, to be produced during three ſucceſſive years after the year 1812, and ſold at any public market in England or Wales. Each perſon who propoſes to become a Candidate for theſe Premiums muſt ſend an account of the number of trees, their culture, pruning, and every circumſtance which can in the leaſt throw any light on the ſubject; which information will be regiſtered, with a view to form a ſyſtem of rational culture.

74. And that Gentlemen may be induced to come forward, and to make and preſerve ſuch plantations,—The perſon who can produce an ORCHARD which, at the end

of three years after planting, ſhall ſhew the greateſt promiſe of ſucceſs, ſhall be entitled to the GOLD MEDAL, or THIRTY GUINEAS.

The merits of the two firſt-mentioned Premiums being to be aſcertained by the fruit; the merit of the third Premium muſt be aſcertained by the judicious number of trees planted, the ſtraitneſs, clearneſs, and freedom of growth of the ſeveral trees; and that all the young branches run free, and at due diſtance from each other, without any galling or canker.

CERTIFICATES of the forming the Orchard, the ſoil and aſpect of the plantation, the ſale and product of the fruit for which the claims for the Premiums, Claſſes 72 and 73, are intended to be made, muſt be delivered to the Society on or before the firſt Tueſday in November, 1815; and the Certificate in claim of the Premium, Claſs 74, muſt be delivered to the Society on or before the firſt Tueſday in November, 1799.

N. B.

N. B. However expert the Orchardiſt may be in general information and attention, much will depend on ſoil, expoſure, culture, and an eaſy communication to convey the fruit to market; for every field, however valuable in other reſpects, may not be proper for an Orchard.

Any wood the Orchardiſt may chooſe to raiſe for ſhelter to ſuch plantation, is not to be meaſured as part of the Orchard, as the wood will more than ſupport its own expence.

75, 76, 77. The foregoing Premiums for Orchards, from Claſs 72 to Claſs 74 incluſive, are extended one year further. The claims for the Premiums, Claſs 72 and 73, to be delivered to the Society on or before the firſt Tueſday in November, 1816; and the Certificate in claim of the Premium, Claſs 74, muſt be delivered on or before the firſt Tueſday in November, 1800.

*** *The Candidates for planting all kinds of Trees are to certify, that the reſpective*

Plantations are properly fenced and ſecured, and particularly to ſtate the condition the plants were in at the time of ſigning ſuch Certificate.

Any information which the Candidates for the foregoing Premiums may chooſe to communicate, relative to the methods made uſe of in forming the Plantation, or promoting the growth of the ſeveral Trees, or any other obſervations that may have occurred on the ſubject, will be thankfully received.

78. SECURING PLANTATIONS OF TIMBER-TREES. To the perſon who ſhall give to the Society the moſt ſatisfactory Account, founded on experience, of the moſt effectual and leaſt expenſive method of ſecuring young plantations of timber-trees from Hares and Rabbits, as well as Sheep and larger cattle, which at the ſame time ſhall be leaſt ſubject to the depredations of wood-ſtealers; the SILVER MEDAL, or TWENTY GUINEAS.

The

The ACCOUNTS, and CERTIFICATES of the efficacy of the method, to be produced to the Society on or before the firſt Tueſday in November, 1799.

79. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in November, 1800.

80. PREVENTING THE BLIGHT ON FRUIT-TREES. To the perſon who ſhall diſcover to the Society the beſt and moſt effectual method of preventing the Blight on Fruit-trees, ſuperior to any hitherto known or practiſed, and verified by actual and comparative experiments; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be delivered to the Society on or before the ſecond Tueſday in November, 1799.

81.

81. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1800.

82. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the ſecond Tueſday in November, 1801.

83. TAKING OFF THE ILL EFFECTS OF BLIGHTS. To the perſon who ſhall diſcover to the Society the beſt and moſt effectual method of taking off the ill effects of Blights on Fruit-trees, ſuperior to any hitherto known or practiſed, and verified by actual and comparative experiments; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS and CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in February, 1800.

84.

84. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments, made on not leſs than eight acres, four of which to be ſown broad-caſt, and four drilled, to aſcertain whether it is moſt advantageous to cultivate Wheat by ſowing it in the common broad-caſt way, or by drilling it in equidiſtant rows, hoeing the intervals; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that an account of the expence attending each mode of culture, with proper CERTIFICATES of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society on or before the firſt Tueſday in February, 1800.

85. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the firſt Tueſday in February, 1801.

86.

86. COMPARATIVE CULTURE OF WHEAT. For the beſt ſet of experiments, made on not leſs than eight acres of land, four of which to be ſown broad-caſt, and four dibbled, to aſcertain whether it is moſt advantageous to cultivate Wheat by ſowing it in the common broad-caſt way, or by dibbling it in equidiſtant rows, hoeing the intervals; the GOLD MEDAL, or the SILVER MEDAL and THIRTY GUINEAS.

It is required that an account of the expence attending each mode of culture, with proper certificates of the nature and condition of the land on which the experiments are made, together with an account of the produce of the Corn, be produced to the Society on or before the firſt Tueſday in February, 1800.

87. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the firſt Tueſday in February, 1801.

88.

88. BEANS AND WHEAT. To the perſon who ſhall have planted or drilled, between the firſt of December, 1797, and the firſt of April, 1798, the greateſt quantity of land, not leſs than ten acres, with Beans, and ſhall have ſown the ſame land with Wheat in the ſame year 1798; TWENTY GUINEAS.

It is required that an account of the ſort and quantity of Beans, the time of planting or drilling, and of reaping or mowing them, the produce per acre threſhed, the application of the ſtraw, the expence of planting or drilling, hand or horſe hoeing, the diſtance of the rows, and the quality of the ſoil, together with CERTIFICATES of the number of acres, and that the land was actually ſown with Wheat in the year 1798, be produced on or before the firſt Tueſday in November, 1799.

N. B. The Society have been informed, that Beans may be drilled or planted ſo early as the month of December, from whence may

may be derived the advantage of an early harveſt; in which caſe the ſtraw will be far more valuable than that from a later planting or drilling.

89. TURNEPS. For the beſt account of experiments made on at leaſt ſix acres of land, to determine the comparative advantage of the drill or broad-caſt method in the cultivation of Turneps; the GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be delivered on or before the third Tueſday in March, 1800.

It is required that one half of the land be drilled, and the other half ſown broad-caſt.

90. VEGETABLE FOOD. For the beſt account, confirmed by experiments, of the Vegetable Food (Cabbages and Turneps excepted), growing in the months of March and April, that will moſt increaſe the milk

in

in Mares, Cows, and Ewes, at that ſeaſon; provided ſuch food can be cultivated at an expence that will admit of its being applied to the above purpoſes; the GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1799.

91. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1800.

92. CULTIVATING ROOTS AND HERBAGE FOR FEEDING SHEEP AND BLACK CATTLE. For the moſt ſatisfactory experiments, made between Michaelmas, 1798, and the firſt of May, 1799, in order to aſcertain which of the following plants can be cultivated and houſed or otherwiſe

wiſe ſecured for winter-fodder, to the greateſt advantage, viz.

Turnep-rooted Cabbage,	Carrots,
Turnep Cabbage,	Parſneps,
Turneps,	Potatoes;

the GOLD MEDAL.

The ACCOUNTS, with proper CERTIFICATES, to be produced on or before the firſt Tueſday in November, 1799.

It is required that the above roots be taken off the land by the laſt day of October, 1798; that a crop of Wheat may be ſown in the ſame ground, and the particulars of the ſowing and planting, taking up, produce, preſerving, and application to the feeding Sheep and Black Cattle, be ſpecified. The comparative experiments muſt be made between two or more of any of the above-mentioned plants, and not leſs than one acre be cultivated with each particular kind of plant.

N. B. Great advantage will ariſe to the Farmer occupying land in the neighbourhood

hood of extenſive commons, from the conveniency of keeping large flocks of Sheep, and herds of Cattle, if the difficulty of ſupporting them through the winter was obviated by a due knowledge of this practice.

93. PARSNEPS. To the perſon who, in the year 1799, ſhall cultivate the greateſt quantity of land, not leſs than five acres, with Parſneps, for the ſole purpoſe of feeding Cattle or Sheep; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES of the quantity of land ſo cultivated, with a particular account of the nature and quality of the ſoil and produce, and alſo of the condition of the Cattle or Sheep fed with the Parſneps, and the advantages reſulting from the practice, to be produced to the Society on or before the ſecond Tueſday in February, 1800.

94. The ſame premium is extended one year further.

The CERTIFICATES and ACCOUNTS to be produced on or before the ſecond Tueſday in February, 1801.

95. MAKING MEADOW HAY IN WET WEATHER. To the perſon who ſhall diſcover to the Society the beſt and cheapeſt method, ſuperior to any hitherto practiſed, of making Meadow Hay in Wet Weather, the GOLD MEDAL, or THIRTY GUINEAS.

A full account of the method employed, and of the expence attending the proceſs, with not leſs than fifty-ſix pounds of the Hay; and Certificates that at leaſt the produce of ſix acres of land has been made according to the method deſcribed, and that the whole is of equal quality with the ſamples; to be produced on or before the firſt Tueſday in January, 1800.

96. HARVESTING CORN IN WET WEATHER. To the perſon who ſhall

ſhall diſcover to the Society the beſt and cheapeſt method, ſuperior to any hitherto practiſed, of harveſting Corn in Wet Weather, the GOLD MEDAL, or THIRTY GUINEAS.

A full account of the method employed, and of the expence attending the proceſs, with not leſs than two Sheaves of the Corn, and Certificates that at leaſt the produce of four acres has been harveſted according to the method deſcribed, and that the whole is of equal quality with the ſamples, to be produced on or before the firſt Tueſday in January, 1800.

97. CULTIVATING THE TRUE RHUBARB. For having raiſed, before the end of the year 1799, the greateſt number of plants, not leſs than two thouſand, of Rheum Palmatum, or true Rhubarb, the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES of the number of plants, that they ſtand at leaſt four feet aſunder,

that they have been in a thriving ſtate during the preceding ſummer, with an account of the ſoil, culture, and aſpect, to be produced on or before the ſecond Tueſday in February, 1800.

98. The ſame premium is extended one year further.

The CERTIFICATES to be produced on or before the ſecond Tueſday in February, 1801.

99. ASCERTAINING THE COMPONENT PARTS OF ARABLE LAND. To the perſon who ſhall produce to the Society the moſt ſatisfactory ſet of experiments, to aſcertain the due proportion of the ſeveral component parts of Arable Land, in one or more Counties in Great Britain, by an accurate analyſis of it; and who, having made a like analyſis of ſome poor land, ſhall, by comparing the component parts of each, and thereby aſcertaining the deficiencies of the poor ſoil, improve a

quantity

quantity of it, not leſs than one acre, by the addition of ſuch parts as the former experiments ſhall have diſcovered to be wanting therein, and therefore probably the cauſe of its ſterility; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the manurings, ploughings, and crops of the improved land, be the ſame after the improvement as before; and that a minute account of the produce in each ſtate, of the weather, and of the various influencing circumſtances, together with the method made uſe of in analyſing the ſoils, be produced, with proper CERTIFICATES, and the chemical reſults of the analyſis, which are to remain the property of the Society, on or before the laſt Tueſday in November, 1799.

It is expected that a quantity, not leſs than ſix pounds, of the rich, of the poor, and of the improved ſoils, be produced, with the Certificates.

N. B. Among the methods or proceſſes made uſe of by Chemiſts, and called DRY

or MOIST, the latter only appears adapted to the aſcertaining the reſpective proportions of the component parts of Arable earth. Dr. Shaw, in his Chemical Lectures; Dr. Home, in his Principles of Agriculture; Dr. George Fordyce, in his Elements of Agriculture; and Sir Torbern Bergman, in his "Diſſertation ſur les Terres Géoponiques;" have treated on theſe ſubjects.

100. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1800.

101. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the laſt Tueſday in November, 1801.

102. IMPROVING LAND LYING WASTE. For the moſt ſatisfactory Account

count of the beſt method of improving any of the following ſoils, being land lying waſte or uncultivated, viz. Clay, Gravel, Sand, Chalk, Moor or Peat-earth and Bog; verified by experiments on not leſs than fifty acres of land; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

103. For the next greateſt quantity of land, not leſs than twenty-five acres, the SILVER MEDAL and TEN GUINEAS.

To be produced, with proper CERTIFICATES, on or before the ſecond Tueſday in December, 1799.

The ſoil, manner of improvement, expence, and product, together with an account of the uſes the improved land has been applied to, are required to be fully explained.

104, 105. The ſame premiums are extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1800.

106, 107. The ſame premiums are extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1801.

N.B. In all claims for this premium, of this or ſubſequent dates, it will be expected that the claimants produce ſome experiments of ſuch a new kind, as the Society have not granted rewards for.

108. MANURES. For the moſt ſatisfactory ſet of experiments, to aſcertain the comparative advantages of the following Manures, uſed as Top-dreſſings, on Graſs or Corn Land, viz. Soot, Coal-Aſhes, Wood-Aſhes, Lime, Gypſum, Night-ſoil, or any other fit article; the GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS.

It is required that the above experiments be made between two or more of the above-mentioned Manures, and that not leſs than

two

two acres of land be dreſſed with each Manure. An account of the nature of the ſoil, quantity and expence of the Manure, and crops, with CERTIFICATES, to be produced on or before the laſt Tueſday in February, 1800.

109. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the laſt Tueſday in February, 1801.

110. IMPROVING WASTE MOORS. For the improvement of the greateſt number of acres of Waſte Moor-Land, not leſs than one hundred, the GOLD MEDAL.

It is required that the land before improvement be abſolutely uncultivated, and in a great meaſure uſeleſs; that in its improved ſtate it be incloſed, cultivated, and divided into fields, ſufficient for the uſe and occupation of a tenant.

111. For the next greateſt quantity, not leſs than fifty acres, the SILVER MEDAL, or TWENTY GUINEAS.

112. For the next greateſt quantity, not leſs than twenty-five acres, the SILVER MEDAL, or TEN GUINEAS.

CERTIFICATES of the number of acres, of the quality of the Moor ſo improved, of the mode and expence of the improvement, the ſtate it is in as to the proportion of graſs to arable, and the average value thereof, to be produced on or before the firſt Tueſday in February, 1800.

113, 114, 115. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1801.

116, 117, 118. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1802.

119, 120, 121. The ſame premiums are extended one year further.

CER-

CERTIFICATES to be produced on or before the firſt Tueſday in February, 1803.

122. GAINING LAND FROM THE SEA. To the perſon who ſhall produce to the Society an account of the beſt method, verified by actual experiment, of gaining Land from the Sea, not leſs than twenty acres, on the coaſt of Great-Britain, the GOLD MEDAL.

CERTIFICATES of the quantity of Land, and that the experiments were begun after the firſt of January, 1794, to be produced to the Society on or before the firſt Tueſday in October, 1799.

N. B. The Society have been credibly informed, that land has been gained on the coaſt of Holland, by fixing rows of whiſps of ſtraw upright in the ſand, at about a foot diſtant from each other, or by fixing ſtakes at proper diſtances from each other, and wattling ſtraw-bands between them.

123. The ſame premium is extended one year further.

CER-

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1800.

124. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1801.

125. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in October, 1802.

126. MACHINE FOR DIBBLING WHEAT. To the perſon who ſhall invent the beſt Machine, to anſwer the purpoſe of Dibbling Wheat, by which the holes for receiving the grain may be made at equal diſtances and proper depths, the grain regularly delivered therein, and effectually covered; the SILVER MEDAL, or TWENTY GUINEAS.

The MACHINE, with CERTIFICATES that at leaſt three acres have been dibbled by

by it, to be produced to the Society on or before the ſecond Tueſday in January, 1800. Simplicity and cheapneſs in the conſtruction will be conſidered as principal parts of its merit.

127. MACHINE TO ANSWER THE PURPOSE OF REAPING OR MOWING CORN. For inventing a Machine to anſwer the purpoſe of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiouſly and cheaper than by any method now practiſed, provided it does not ſhed the corn or pulſe more than the methods in common practice, and that it lays the ſtraw in ſuch a manner as that it may be eaſily gathered up for binding; the GOLD MEDAL, or THIRTY GUINEAS.

The MACHINE, with CERTIFICATES that at leaſt three acres have been cut by it, to be produced to the Society on or before the ſecond Tueſday in December, 1799.

Simplicity

Simplicity and cheapneſs in the conſtruction will be conſidered as principal parts of its merit.

128. DESTROYING THE GRUB OF THE COCKCHAFER. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the Grub of the Cockchafer, or of preventing or checking the deſtructive effects which always attend Corn, Peas, Beans, and Turneps, when attacked by thoſe inſects; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be produced on or before the firſt Tueſday in January, 1800.

129. DESTROYING THE WIRE-WORM. To the perſon who ſhall diſcover to the Society an effectual method, verified by repeated and ſatisfactory trials, of deſtroying the Inſect called the Wire-Worm,

or

or of preventing or checking the deſtructive effects which always attend Corn, Beans, Peaſe, or Pulſe, when attacked by thoſe inſects; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES, to be produced to the Society on or before the firſt Tueſday in January, 1800.

130. DESTROYING THE FLY ON HOPS, AND CATERPILLARS ON FRUIT-TREES AND CULINARY PLANTS. To the perſon who ſhall diſcover to the Society an eaſy and efficacious method of deſtroying the Fly on Hops, and Caterpillars on Fruit-trees and Culinary Plants, ſuperior to any hitherto known or practiſed, the GOLD MEDAL, or FIFTY GUINEAS.

ACCOUNTS, and CERTIFICATES that the method has been effectually practiſed, on not leſs than ſix acres of Hop-ground, or an Orchard or Garden of not leſs than

two

two acres, to be delivered to the Society on or before the first Tuesday in February, 1800.

131. CURE OF THE ROT IN SHEEP. To the person who shall discover to the Society the best and most effectual method of preventing or curing the disease called the Rot in Sheep, verified by repeated and satisfactory experiments, the GOLD MEDAL, or FIFTY GUINEAS.

It is expected that the Candidates furnish accurate accounts of the nature, symptoms, and cure of the disease, together with the imputed cause thereof, and the actual or probable means of prevention, which, with proper CERTIFICATES, must be delivered to the Society on or before the first Tuesday in February, 1800.

132. PREVENTING AND CURING THE ILL EFFCTS OF THE FLY ON SHEEP. To the person who shall discover

discover to the Society the most effectual method of preventing and curing the ill effects of the Fly on Sheep, the SILVER MEDAL, or TWENTY GUINEAS.

It is required that the method be ascertained by repeated experiments, and that a CERTIFICATE of its efficacy be delivered to the Society on or before the first Tuesday in December, 1799.

133. PROTECTING SHEEP. To the person who, in the year 1799, shall protect the greatest number of Sheep, not fewer than five hundred, in bad seasons, by housing them in hovels or sheds; and give the most satisfactory account, verified by experiment, of the advantages arising from the practice of defending Sheep from the inclemency of the weather, by such hovels or sheds; TWENTY GUINEAS.

A particular account of the experiments made, with the advantages arising therefrom, together with the expence, and CERTIFI-

CATES of its utility, to be produced to the Society on or before the firſt Tueſday in March, 1800.

134. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the firſt Tueſday in March, 1801.

N. B. It is at the option of the Candidates to have their hovels fixed, or moveable; and it is required, that the CERTIFICATES ſhall ſpecify the length of time the Sheep were under cover, and the manner in which they were maintained during that time; together with the general method of managing them in the ſaid hovels.

135. IMPROVING THE CONDITION OF THE LABOURING POOR, BY ERECTING COTTAGES, AND APPORTIONING LAND. To the perſon who, in the year 1799, ſhall erect the greateſt number of Cottages for the accommodation

commodation of the Labouring Poor, and apportioning not leſs than two acres of Land to each Cottage; the GOLD MEDAL.

136. IMPROVING THE CONDITION OF THE LABOURING POOR, BY APPORTIONING LAND TO COTTAGES. To the perſon who, in the year 1799, ſhall apportion to the greateſt number of Cottages already built upon his or her eſtate, any quantity of Land, not leſs than two acres to each Cottage, for the better accommodation of the reſpective inhabitants; the GOLD MEDAL.

The ACCOUNTS of the number of Cottages erected, and of the quantity of Land apportioned to each, to be delivered to the Society, with proper CERTIFICATES, on or before the firſt Tueſday in February, 1800.

137, 138. The ſame premiums are extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in February, 1801.

139, 140. The same premiums are extended one year further.

The ACCOUNTS and CERTIFICATES to be delivered on or before the first Tuesday in February, 1802.

Premiums

Premiums for Diſcoveries and Improvements in Chemiſtry, Dying, and Mineralogy.

141. BARILLA. For the greateſt quantity of Merchantable Barilla, not leſs than half a ton, made from Spaniſh Kali, or any other plant raiſed in Great Britain; the GOLD MEDAL, or THIRTY GUINEAS.

A ſample, of not leſs than twenty-eight pounds, with a CERTIFICATE that half a ton has been made, to be produced on or before the firſt Tueſday in January, 1800.

142. PRESERVING SEEDS OF VEGETABLES. For the beſt method of preſerving the ſeeds of Plants, in a ſtate fit for vegetation, a longer time than has hitherto been practiſed, ſuch method being ſuperior to any known to the public, and verified by ſufficient trial; to be communicated to the Society on or before the firſt Tueſday in December, 1799; the GOLD MEDAL, or THIRTY GUINEAS.

143. The ſame premium is extended one year further; the ACCOUNTS to be produced on or before the firſt Tueſday in December, 1800.

144. METHOD OF SEPARATING THE SACCHARINE SUBSTANCE OF TREACLE IN A SOLID FORM. To the perſon who ſhall diſcover to the Society the beſt method of ſeparating the Saccharine Subſtance of Treacle in a ſolid form, at ſuch an expence as will render it advantageous to the public; the GOLD MEDAL, or FIFTY GUINEAS.

A quantity of the Saccharine Subſtance, ſo ſeparated, in a ſolid form, not leſs than thirty pounds weight, with an account of the proceſs, and CERTIFICATES that not leſs than one hundred weight has been prepared, to be produced to the Society on or before the firſt Tueſday in February, 1800.

145. PRESERVING FRESH-WATER SWEET. To the perſon who ſhall produce

produce to the Society the beſt account, verified by ſatisfactory trials, of an efficacious method of preſerving Freſh-water ſweet during long voyages; the GOLD MEDAL, or FIFTY GUINEAS.

ACCOUNTS, and full deſcriptions of the methods made uſe of, in order that it may be known that nothing injurious enters therein, to be produced to the Society, with at leaſt thirty gallons of Water ſo preſerved, and proper CERTIFICATES, on or before the laſt Tueſday in December, 1799.

146. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the laſt Tueſday in December, 1800.

147. PURIFYING BRACKISH WATER. To the perſon who ſhall diſcover to the Society the beſt and cheapeſt method, verified by actual experiment, of Purifying or reducing Brackiſh Water, which fre-

quently ariſes from New Wells, made in particular places, to a natural ſweetneſs, fit for the uſe of families and for the purpoſe of cattle; the SILVER MEDAL, or FIFTEEN GUINEAS.

Satisfactory CERTIFICATES that ſuch Brackiſh Water has been rendered perfectly ſweet, and uſed by the family to which ſuch Well may belong at leaſt three months afterwards, with an account of the method made uſe of in purifying the ſame, to be delivered to the Society on or before the ſecond Tueſday in February, 1800.

148. DESTROYING SMOKE. For the beſt account, aſcertained by proper experiments, of a cheap method of deſtroying or burning the Smoke of Fires belonging to Steam-Engines, Furnaces employed in calcining or ſmelting Metals, or other large works, in order to prevent annoyance to the neighbourhood; to be produced on or before the firſt Tueſday in January, 1800; the GOLD MEDAL, or THIRTY GUINEAS.

149.

149. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the firſt Tueſday in January, 1801.

150. CONDENSING SMOKE. To the perſon who ſhall invent the beſt method by which the Smoke of Steam-Engines, Brewhouſes, Sugar-houſes, or Furnaces, may be advantageouſly condenſed and collected in the form of Tar, or ſome other uſeful material; the GOLD MEDAL, or FIFTY GUINEAS.

The ACCOUNTS, with proper CERTIFICATES of the method having been ſucceſsfully employed, and ſpecimens of the materials produced, to be delivered to the Society on or before the firſt Tueſday in December, 1799.

151. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in December, 1800.

152.

152. CANDLES FROM RESIN OR OTHER SUBSTANCE. To the perſon who ſhall diſcover to the Society the beſt method of making Candles of Reſin, or any other ſubſtance, fit for common uſe, at a price much inferior to thoſe made of Tallow only; the GOLD MEDAL, or THIRTY GUINEAS.

Six pounds at leaſt of the Candles ſo prepared, with an ACCOUNT of the proceſs, to be delivered to the Society on or before the firſt Tueſday in December, 1799.

153. REFINING WHALE OR SEAL OIL. For diſcloſing to the Society an effectual method of purifying Whale or Seal Oil from the glutinous matter that encruſts the wicks of lamps and extinguiſhes the light, though fully ſupplied with oil; the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the whole of the proceſs be fully and fairly diſcloſed, in order that ſatisfactory experiments may be made by the Society to determine the validity of the

the claim; and CERTIFICATES that not leſs than twenty gallons have been purified according to the proceſs delivered in, together with two gallons of the oil, in its unpuriſied ſtate, and two gallons ſo refined, be produced to the Society on or before the ſecond Tueſday in February, 1800.

154. The ſame premium is extended one year further.

CERTIFICATES and SAMPLES to be produced on or before the ſecond Tueſday in February, 1801.

155. CLEARING FEATHERS FROM THEIR ANIMAL OIL. To the perſon who ſhall diſcover to the Society the beſt and moſt expeditious method, ſuperior to any hitherto practiſed, of clearing Gooſe-feathers from their offenſive Animal Oil, for the uſe of Upholders, in making beds, cuſhions, &c. the GOLD MEDAL, or FORTY GUINEAS.

A quantity of ſuch Feathers, unſtripped, and ſo cleared, not leſs than forty pounds weight,

weight, with a full account of the proceſs, to be produced to the Society on or before the firſt Tueſday in February, 1800.

156. SUBSTITUTE FOR, OR PREPARATION OF, YEAST. For diſcovering to the Society an effectual Subſtitute for Yeaſt, or preparation of Yeaſt, which, after being kept ſix months, ſhall be fit for fermenting liquors, and raiſing bread; the GOLD MEDAL, or THIRTY GUINEAS.

Specimens of the Subſtitute, or of the Preparation of Yeaſt, ſufficient for trials, together wlth a paper ſealed up, and containing an account of the compoſition of the Subſtitute, or method of preparing the Yeaſt, to be produced on or before the laſt Tueſday in November, 1799.

157. PROOF SPIRIT. To the Diſtiller who in the year 1799 ſhall make the greateſt quantity, not leſs than one hundred gallons, of a clean marketable Spirit, from

articles

articles not the food of man or cattle, equal in ſtrength or quality to the Proof Spirit now in uſe, and at a rate not higher than the ſpirit produced from corn or melaſſes; the GOLD MEDAL, or FIFTY GUINEAS.

Ten gallons of the Spirit, together with proper CERTIFICATES, and a full account of the expence and mode of making it, to be produced to the Society on or before the firſt Tueſday in January, 1800.

158. PRESERVING SALTED PROVISIONS FROM BECOMING RANCID OR RUSTY. To the perſon who ſhall diſcover to the Society the beſt, cheapeſt, and moſt efficacious method of preſerving Salted Proviſions from growing rancid or ruſty; the GOLD MEDAL, or THIRTY GUINEAS.

A full deſcription of the method, with proper CERTIFICATES that it has been found, on repeated trials, to anſwer the purpoſe intended, to be produced to the Society on or before the firſt Tueſday in February, 1800.

159. The

159. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in February, 1801.

160. INCREASING STEAM. To the perſon who ſhall diſcover to the Society a method, verified by actual experiments, of increaſing the quantity or the force of Steam, in Steam-Engines, with leſs fuel than is uſually employed, provided that in general the whole amount of the expences, in uſing Steam-Engines, may be conſiderably leſſened; the GOLD MEDAL, or THIRTY GUINEAS.

To be communicated to the Society on or before the firſt Tueſday in January, 1800.

N. B. As it is well known there are methods of preventing the ebullition of liquids by the addition of particular matters in the boiling, it is ſubmitted to the conſideration of the ingenious, whether, by the addition

addition of ſome matters, or by ſome mechanical operations, the boiling and evaporation may not be increaſed.

161. PREVENTING THE DRY-ROT IN TIMBER. To the perſon who ſhall diſcover to the Society the cauſe of the Dry-Rot in Timber, and diſcloſe a certain method of prevention, ſuperior to any hitherto known; the GOLD MEDAL, or THIRTY GUINEAS.

The ACCOUNTS of the cauſe, and method of prevention, confirmed by repeated experiments, to be produced to the Society on before the ſecond Tueſday in December, 1799.

162. The ſame premium is extended one year further.

The ACCOUNTS to be produced on or before the ſecond Tueſday in December, 1800.

163. FINE BAR-IRON. To the perſon, in Great Britain, who ſhall make the

the greateſt quantity of Bar-Iron, not leſs than ten tons, with Coak, from Coak Pigs, equal in quality to the beſt Iron imported from Sweden or Ruſſia, and as fit for converting into Steel; the GOLD MEDAL.

SAMPLES, not leſs than one hundred weight, with CERTIFICATES that the whole quantity is of equal quality, to be produced to the Society on or before the firſt Tueſday in January, 1800.

164. METHOD OF PREPARING WHITE LEAD, WHICH SHALL NOT BE PREJUDICIAL. To the perſon who ſhall diſcover to the Society a method of preparing White Lead, in a manner that ſhall not be prejudicial to the health of the Workmen employed either in making or uſing it, and will anſwer all the purpoſes for which White Lead is at preſent uſed; the GOLD MEDAL, or FIFTY GUINEAS.

A quantity of the White Lead ſo prepared, with an account of the proceſs made uſe of,

of, and CERTIFICATES that not leſs than one ton has been manufactured in the ſame manner, to be produced to the Society on or before the ſecond Tueſday in February, 1800.

165. SUBSTITUTE FOR THE BASIS OF PAINT. To the perſon who ſhall produce to the Society the beſt Subſtitute, ſuperior to any hitherto known, for the Baſis of Paint, equally proper for the purpoſe as the White Lead now employed; ſuch ſubſtitute not to be of a noxious quality, and which may be afforded at a price not materially higher than that of White Lead; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

A quantity of the Subſtitute, not leſs than fifty pounds weight, with an ACCOUNT of the proceſs uſed in preparing it, and CERTIFICATES that at leaſt one hundred weight has been manufactured, to be produced to the Society on or before the ſecond Tueſday in November, 1799.

166. The ſame premium is extended one year further.

CERTIFICATES and ACCOUNTS to be produced on or before the ſecond Tueſday in November, 1800.

167. RED PIGMENT. To the perſon who ſhall diſcover to the Society a full and ſatisfactory proceſs for preparing a red Pigment, fit for uſe, in oil or water, equal in tone and brilliancy to the beſt Carmines and Lakes now known or in uſe, and perfectly durable; the GOLD MEDAL, or THIRTY GUINEAS.

One pound weight of ſuch Colour, and a full diſcloſure of its preparation, to be produced to the Society on or before the firſt Tueſday in February, 1800.

N. B. It is not required that the Colour ſo to be produced ſhould reſiſt the action of fire or chemical applications, but remain unaltered by the common expoſure to ſtrong light, damps, and noiſome vapours.

168.

168. REFINING BLOCK TIN. To the perſon who ſhall diſcover to the Society the beſt method of purifying or refining *Block Tin*, in ſuch a manner as to render it fit for the finer purpoſes to which *Grain Tin* is now ſolely applied, and at an expence that ſhall not render it higher in price than *Grain Tin*; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES that not leſs than three tons have been refined or purified, with a full detail of the proceſs, and a quantity, not leſs than one hundred weight, of the Tin ſo refined, to be produced to the Society on or before the firſt Tueſday in November, 1799.

169. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the firſt Tueſday in November, 1800.

170. GLAZING EARTHEN WARE WITHOUT LEAD. To the perſon who

ſhall diſcover to the Society the cheapeſt, ſafeſt, moſt durable, and moſt eaſily fuſible Compoſition, fit for the purpoſe of glazing the ordinary kinds of Earthen Ware, without any preparation of Lead, and equal to any hitherto in uſe; the GOLD MEDAL, or THIRTY GUINEAS.

SPECIMENS of the Ware ſo glazed, with proper CERTIFICATES of its having ſucceeded, and a SAMPLE of the materials made uſe of, to be produced to the Society on or before the firſt Tueſday in February, 1800.

171. BLACK DYE ON COTTON. To the perſon who ſhall invent and produce to the Society a Black Dye on Cotton Yarn, ſuperior to any hitherto known or in uſe; the GOLD MEDAL, or THIRTY GUINEAS.

A full ACCOUNT of the proceſs, with CERTIFICATES that the Cotton thus dyed ſtands waſhing with ſoap, and a SAMPLE of the Yarn ſo dyed, not leſs than five pounds weight, to be produced to the Society on

or

or before the firſt Tueſday in February, 1800.

172. PRESERVING IRON FROM RUST. To the perſon who ſhall invent and diſcover to the Society, a cheap Compoſition, which ſhall effectually preſerve Wrought Iron from Ruſt, the GOLD MEDAL, or FIFTY GUINEAS.

A full deſcription of the method of preparing the Compoſition, with CERTIFICATES that it has ſtood at leaſt two years unimpaired, and expoſed to the atmoſphere during the whole time, to be produced to the Society, with ten pounds weight of the compoſition, on or before the firſt Tueſday in January, 1800.

173. The ſame premium is extended one year further.

The deſcription and CERTIFICATES to be produced to the Society on or before the firſt Tueſday in January, 1801.

174. The ſame premium is extended one year further.

The deſcription and CERTIFICATES to be produced to the Society on or before the laſt Tueſday in January, 1802.

175. OPIUM. To the perſon who, in the year 1799, ſhall prepare the greateſt quantity, not leſs than twenty pounds weight, of Opium, from Poppies grown in Great Britain, and equal in quality to the beſt foreign Opium; the GOLD MEDAL, or FIFTY GUINEAS.

176. For the next greateſt quantity, not leſs than ten pounds weight, the SILVER MEDAL, or TWENTY GUINEAS.

SAMPLES of the Opium, not leſs than five pounds weight, with proper CERTIFICATES that the whole is of the ſame quality, to be produced to the Society, with a particular account of the method of cultivating the Poppies, and preparing the Opium, on or before the laſt Tueſday in February, 1800.

177,

177, 178. The ſame premiums are extended one year further.

The SAMPLES, CERTIFICATES, and ACCOUNTS, to be produced to the Society on or before the laſt Tueſday in February, 1801.

179. SUBSTITUTE FOR TAR. To the perſon who ſhall invent and diſcover to the Society the beſt Subſtitute for Vegetable Tar, equal in all its properties to the beſt Stockholm Tar, and prepared from materials the produce of Great-Britain; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

A quantity of the Subſtitute, not leſs than one hundred weight, with CERTIFICATES that at leaſt one ton has been manufactured, and that it can be afforded at a price not exceeding that of the beſt foreign Tar, together with an Account of the proceſs, to be delivered to the Society on or before the firſt Tueſday in March, 1800.

180. The ſame premium is extended one year further.

The SAMPLES, CERTIFICATES, and ACCOUNTS, to be delivered to the Society on or before the firſt Tueſday in March, 1801.

Premiums

Premiums for promoting the Polite Arts.

181. HONORARY PREMIUMS FOR DRAWINGS. For the beſt Drawing of any kind, made with Water-Colours, Crayons, Chalk, Black Lead, Pen, Indian Ink, or Biſter, by young Gentlemen under the age of twenty-one, ſons or grandſons of Peers, or Peereſſes in their own right, of Great Britain or Ireland, to be produced on or before the firſt Tueſday in March, 1800, the HONORARY MEDAL of the Society IN GOLD.

182. The ſame IN SILVER for the next in merit.

183, 184. The ſame premiums will be given, on the like conditions, to young Ladies, daughters or grand-daughters of Peers, or Peereſſes in their own right, of Great Britain or Ireland.

185. HONORARY PREMIUMS FOR DRAWINGS. For the beſt Drawing

ing of any kind, made with Water-colours, Crayons, Chalk, Black Lead, Pen, Indian Ink, or Biſter, by young Gentlemen under the age of twenty-one; to be produced on or before the firſt Tueſday in March, 1800; the GOLD MEDAL.

180. For the next in merit, the SILVER MEDAL.

187, 188. The ſame premiums will be given for Drawings by young Ladies.

N. B. As the foregoing Honorary Premiums are intended only for ſuch of the Nobility and Gentry as may hereafter become patrons or patroneſſes of the Arts; perſons profeſſing any branch of the Polite Arts, or any buſineſs dependent on the Arts of Deſign, or the ſons or daughters of ſuch perſons, will not be admitted Candidates in theſe Claſſes.

The

The following Premium (Claſs 189) is offered in conformity to the Will of the late John Stock, of Hampſtead, Eſq.

189. SCULPTURE. For the beſt Baſſo-relievo in Terra Cotta, the ſubject taken from the Iliad of Homer, and conſiſting of not fewer than three human figures, the height of the principal figure not leſs than twelve inches, to be produced on or before the third Tueſday in February, 1800, a SILVER MEDALLION, with the following engraved inſcription: *The Premium given by the Society for the Encouragement of Arts, Manufactures, and Commerce, in conformity to the Will of John Stock, of Hampſtead, Eſq.*

The Baſſo-relievo to which the premium is adjudged to remain the property of the Society.

190. DRAWINGS OF OUTLINES. For the beſt Outline, after an original group

or

or caſt, in plaſter, of Human Figures, by perſons of either ſex, under the age of ſixteen, the principal figure not leſs than twelve inches; to be produced on or before the third Tueſday in February, 1800; the greater SILVER PALLET.

191. For the next in merit, the leſſer SILVER PALLET.

N. B. Theſe Drawings are to be made on Paper; and the original either to be produced to the Society, or to be referred to for their examination.

192. DRAWINGS OF LANDSCAPES. For the beſt Drawing of a Landſcape after nature, by perſons of either ſex, under twenty-one years of age, to be produced on or before the third Tueſday in February, 1800, the greater SILVER PALLET.

193. For the next in merit, the leſſer SILVER PALLET.

Each

Each Candidate muſt mention, on the front of the Drawing, from whence the View was taken; and the Drawings muſt be made with Chalk, Pen, Indian Ink, Water-Colours, or Biſter.

194. HISTORICAL DRAWINGS. For the beſt Hiſtorical Drawing, being an original compoſition, of five or more Human Figures; the height of the principal figure not leſs than eight inches; to be made with Crayons, Chalk, Black Lead, Pen, Indian Ink, Water-Colours, or Biſter, and to be produced on or before the third Tueſday in February, 1800; the GOLD PALLET.

195. For the next in merit, the greater SILVER PALLET.

196. SURVEYS OF COUNTIES. To the perſon who, in the year 1799, ſhall complete and publiſh an accurate Survey of any one County in England or Wales, on a ſcale of not leſs than one inch to a mile, for which

which rewards have not already been given by the Society; the GOLD MEDAL, or FIFTY GUINEAS.

CERTIFICATES of the accuracy of the Survey, and that it was begun after the firſt of June, 1795, together with the Map, to be produced on or before the laſt Tueſday in January, 1800.

The Map to which the premium ſhall be adjudged, to remain the property of the Society.

N. B. The Society are already in poſſeſſion of Surveys of the following Counties, viz. Bedford, Cheſhire, Cornwall, Cumberland, Derbyſhire, Devonſhire, Dorſetſhire, Durham, Hampſhire, Herefordſhire, Hertfordſhire, Huntingdonſhire, Lancaſhire, Leiceſterſhire, Northamptonſhire, North Wales (large and ſmall), Nottinghamſhire, Oxfordſhire, Somerſetſhire, Staffordſhire, Suffolk, Surrey, Suſſex, Weſtmoreland, and Worceſterſhire.

179. The ſame premium is extended one year further.

The

The Survey to be begun after the firſt of June, 1796; and the Map to be produced on or before the laſt Tueſday in January, 1801.

198. The ſame premium is extended one year further.

The Survey to be begun after the firſt of June, 1797; and the Map to be produced on or before the laſt Tueſday in January, 1802.

199. NATURAL HISTORY. To the Author who ſhall publiſh, in the year 1799, the Natural Hiſtory of any County of England or Wales, the GOLD MEDAL, or FIFTY GUINEAS.

It is required that the ſeveral natural productions, whether animal, vegetable or mineral, peculiar to the County, or found therein, be carefully and ſpecifically arranged and deſcribed, in order that the Public may be enabled to judge what Arts

or

or Manufactures are moſt likely to ſucceed in ſuch County.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1800.

200. The ſame premium is extended one year further.

The Work to be delivered to the Society on or before the laſt Tueſday in January, 1801.

201. The ſame premium is extended one year further.

The Work to be delivered to the Society on or before the firſt Tueſday in January, 1802.

CONDITIONS.

No perſon who has gained the firſt premium in any Claſs, will be admitted a Candidate in a claſs of an inferior age; and no Candidate

Candidate ſhall receive more than one Premium in one year; nor will they who for two ſucceſſive years ſhall gain the firſt Premium in one Claſs, be ever again admitted as Candidates in that Claſs.

No perſon ſhall ever be admitted a Candidate in any Claſs, in which he has three times obtained the whole of the firſt Premium.

No Candidate ſhall ſend in more than one Performance in any one Claſs.

All the Claims which are produced each Seſſion before the Committee of Polite Arts (to which Premiums or Bounties are adjudged), are to remain with the Society till after the public diſtribution of Rewards in May.

No Claim for a Premium in the Polite Arts will be admitted, that has obtained, or has been produced in order to obtain, a Premium, Reward, or Gratification, from any other Society, or any Academy or School.

All Performances that obtain Premiums in the Polite Arts, muſt be begun after the publication of ſuch Premiums.

Purpoſely to encourage real merit, and to prevent any attempts to impoſe on the Society, by producing drawings which ſhall have been made or retouched by any other perſon than the Candidate, the Society is reſolved, upon all occaſions, with reſpect to the ſucceſsful Candidates in Claſſes 190 to 194 incluſive, to prove their abilities, by requiring a ſpecimen made under the inſpection of the Committee of Polite Arts, in every inſtance where ſuch proof can be obtained.

It is required that all Candidates in the Polite Arts do ſignify, on their drawings, their age; and whether the performances are originals, or copies; and, if copies, whence they were taken.

Premiums

Premiums for encouraging and improving Manufactures.

202. SILK. For the greateſt quantity of merchantable Silk, not leſs that ten pounds weight, produced by worms bred in England in the year 1799, the property of any one perſon; the GOLD MEDAL.

203. For the ſecond greateſt quantity, not leſs than five pounds weight; the SILVER MEDAL.

SPECIMENS of the SILK, not leſs than one pound, with CERTIFICATES that the whole is of equal quality, and produced in England, to be delivered to the Society on or before the firſt Tueſday in January, 1800.

204. MACHINE FOR CARDING SILK. For the beſt Machine, ſuperior to any now in uſe, for carding Waſte Silk equally well as by hand; to be produced, together with a ſpecimen of the Cardings,

on or before the firſt Tueſday in November, 1799; the GOLD MEDAL, or THIRTY GUINEAS.

205. CLOTH FROM HOP-STALKS OR BINES. To the perſon who ſhall produce to the Society the greateſt quantity, not leſs than thirty yards, of Cloth, at leaſt twenty-ſeven inches wide, made in Great Britain, of Hop-Stalks or Bines, and ſuperior to any hitherto manufactured in England of that material; the GOLD MEDAL, or THIRTY GUINEAS.

One pound of the Thread of which the Cloth is made, and thirty yards of the Cloth, together with proper CERTIFICATES that the whole is manufactured from Hop-Stalks or Bines, to be produced to the Society on or before the firſt Tueſday in December, 1799.

N. B. The Society are already in poſſeſſion of Cloth made in England from Hop-Stalks or Bines, which may be inſpected by application to the Regiſter.

206.

206. WICKS FOR CANDLES OR LAMPS. To the perſon who ſhall diſcover to the Society a method of manufacturing Hop-Stalks or Bines, or any other cheap material, the growth of Great Britain, ſo as to render them fit for the purpoſe of ſupplying the place of Cotton, for Wicks of Candles or Lamps; TWENTY GUINEAS.

SAMPLES, not leſs than five pounds weight, of the Wicks, ſo prepared, to be produced to the Society, with CERTIFICATES that the whole quantity is equal in quality to the Sample, on or before the ſecond Tueſday in January, 1800.

207. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced on or before the ſecond Tueſday in January, 1801.

208. PAPER FROM RAW VEGETABLE SUBSTANCES. To the perſon

in Great Britain who ſhall make the greateſt quantity, not leſs than ten reams, of the beſt and moſt uſeful Paper, from Raw Vegetable Subſtances; TWENTY GUINEAS.

CERTIFICATES of the making ſuch Paper, and one ream of the Paper, to be produced on or before the firſt Tueſday in November, 1799.

N. B. The Society are in poſſeſſion of two volumes, containing a great variety of ſpecimens of Paper made from Raw Vegetables, viz. Thiſtles, Potatoe-Haum, Poplar, Hop-bines, &c. which volumes may be inſpected by any perſon, on application to the Regiſter.

209. TAKING PORPOISES. To the people in any boat or veſſel, who, in the year 1799, ſhall take the greateſt number of Porpoiſes, on the coaſt of Great Britain, by Gun-Harpoon, or any other method, not fewer than thirty, for the purpoſe of extracting oil from them; THIRTY POUNDS.

CERTI-

CERTIFICATES of the number, ſigned by the perſons to whom they have been ſold or delivered for the purpoſe of extracting the oil, to be produced to the Society on or before the laſt Tueſday in January, 1800.

210. OIL FROM PORPOISES. To the perſon who ſhall manufacture the greateſt quantity of Oil from Porpoiſes taken on the coaſt of Great Britain, in the year 1799, not leſs than thirty tons; THIRTY POUNDS.

211. For the next greateſt quantity, not leſs than fifteen tons, FIFTEEN POUNDS.

CERTIFICATES of the Oil having been made from Porpoiſes actually caught on the coaſt of Great Britain, and two gallons of the Oil, as a Sample, to be produced to the Society on or before the laſt Tueſday in February, 1800.

Premiums for Inventions in Mechanicks.

212. TRANSIT INSTRUMENT. To the perſon who ſhall invent and produce to the Society a cheap and portable Tranſit Inſtrument, which may eaſily be converted into a Zenith Sector, capable of being accurately and expeditiouſly adjuſted for the purpoſe of finding the Latitudes and Longitudes of places, and ſuperior to any portable Tranſit Inſtrument now in uſe; the GOLD MEDAL, or FORTY GUINEAS.

To be produced on or before the laſt Tueſday in January, 1800.

213. TAKING WHALES BY THE GUN-HARPOON. To the perſon who, in the year 1799, ſhall ſtrike the greateſt number of Whales, not fewer than three, with the Gun-Harpoon; TEN GUINEAS.

Proper CERTIFICATES of the ſtriking ſuch Whales, and that they were actually taken

taken in the year 1799, ſigned by the Maſter, or by the Mate when the Claim is made by the Maſter, to be produced to the Society on or before the laſt Tueſday in December, 1799.

214. DRIVING BOLTS INTO SHIPS. To the perſon who ſhall invent and produce to the Society a Model, ſhewing a method of driving Bolts into Ships, particularly thoſe of Copper, without ſplitting the head or bending them, with more diſpatch, in all directions, and tighter than by any means hitherto known or in uſe; the GOLD MEDAL, or FORTY GUINEAS.

The Model, with CERTIFICATES that a Machine on the ſame conſtruction has been uſed to advantage, to be produced to the Society on or before the firſt Tueſday in February, 1800.

215. PARISH OR FAMILY MILL. To the perſon who ſhall invent and produce to the Society, the beſt-conſtructed Mill for grinding

grinding corn for the uſe of private families, or pariſh poor; the conſtruction to be ſuch as to render the working of the Mill eaſy and expeditious, and ſuperior to any hitherto in uſe; the GOLD MEDAL, or FORTY GUINEAS.

The Mill, and CERTIFICATES of its having been uſed to good effect, to be produced to the Society on or before the firſt Tueſday in February, 1800.

N. B. Cheapneſs and ſimplicity will be conſidered as eſſential parts of its merit.

216. MACHINE FOR RAISING COALS, ORE, &c. &c. To the perſon who ſhall invent a Machine for raiſing Coals, Ore, &c. from Mines, which ſhall produce the effect at a leſs expence than thoſe already known or in uſe; the GOLD MEDAL, or FIFTY GUINEAS.

A Model of the Machine, made on a ſcale of not leſs than one inch to a foot, with a CERTIFICATE that a Machine at large

large on the ſame conſtruction has been advantageouſly uſed, to be produced to the Society on or before the ſecond Tueſday in February, 1800.

217. MACHINE FOR RAISING WATER. To the perſon who ſhall invent a Machine, on a better, cheaper, and more ſimple conſtruction than any hitherto known or in uſe, for raiſing Water out of Wells, &c. from a depth not leſs than fifty feet; the GOLD MEDAL, or FORTY GUINEAS.

CERTIFICATES of the performance of the Machine, and a Model of it, on a ſcale of not leſs than one inch to a foot, to be produced to the Society on or before the firſt Tueſday in February, 1800.

218. MACHINE FOR MAKING BRICKS. To the perſon who ſhall invent the beſt and cheapeſt Machine for making Bricks, ſuperior to any hitherto known or in uſe, whereby the labour and expence of making

making Bricks in the uſual mode, by hand, may be greatly diminiſhed; FORTY GUINEAS.

A Model, with CERTIFICATES that a Machine at large, on the ſame conſtruction, has been uſed to good effect for the purpoſe of making Bricks, and that at leaſt one hundred thouſand Statute Bricks have been made therewith, to be produced to the Society on or before the firſt Tueſday in March, 1800.

219. BORING ROCKS IN ORDER TO BLAST THEM. To the perſon who ſhall diſcover to the Society a more cheap, ſimple, and expeditious Method than any hitherto known or in uſe, of Boring Rocks in Mines, Shafts, Wells, &c. for the purpoſe of Blaſting them with Gunpowder; the GOLD MEDAL, or FORTY GUINEAS.

CERTIFICATES of the Method having been practiſed with ſucceſs, with a full deſcription thereof, to be delivered to the Society

Society on or before the firſt Tueſday in January, 1800.

220. PREVENTING PASSENGERS IN CARRIAGES BEING INJURED WHEN THE HORSES HAVE TAKEN FRIGHT. To the perſon who ſhall invent and diſcover to the Society the beſt and moſt effectual method of preventing Paſſengers in Carriages being injured when the Horſes have taken fright; the GOLD MEDAL, or THIRTY GUINEAS.

CERTIFICATES that the Invention has been uſefully applied to at leaſt one Carriage, and may be advantageouſly applied to others, to be produced to the Society on or before the ſecond Tueſday in February, 1800.

221. GUNPOWDER MILLS. To the perſon who, in the year 1799, ſhall invent and bring to perfection the moſt effectual method of ſo conducting the works of Gunpowder Mills, in the buſineſs of making

king Gunpowder, as to prevent the poſſibility of their being blown up and deſtroyed by exploſion; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

CERTIFICATES and ACCOUNTS of the method having been put in practice in one or more Gunpowder Mills in this kingdom, and that it promiſes, in the opinion of the beſt judges concerned in ſuch works, to anſwer the purpoſe intended, to be produced to the Society on or before the firſt Tueſday in February, 1800.

222. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in February, 1801.

N. B. As an encouragement to perſons to turn their thoughts to improvements of this nature, if any ſhould be made on the preſent method of conducting the buſineſs of Gunpowder-making, which fall ſhort of the

the total prevention of explosion, and they are sent to the Society, for the sake of humanity, the Papers so sent in will receive due consideration, and such Bounty or Reward will be bestowed thereon as they appear to merit.

223. MILL STONES. To the person who shall discover, in Great Britain, a Quarry of Stone fit for the purposes of Mill Stones for grinding Wheat, and equal in all respects to that Stone known by the name of FRENCH BURR; the GOLD MEDAL, or ONE HUNDRED POUNDS.

A pair of Mill Stones, at least three feet eight inches diameter, with an account of the situation of the Quarry, and CERTIFICATES that not fewer than two pair of such Mill Stones have been effectually used for grinding Wheat, to be produced to the Society on or before the first Tuesday in February, 1800.

224. The same premium is extended one year further.

The

The ACCOUNTS, SAMPLES, and CERTIFICATES, to be produced to the Society on or before the firſt Tueſday in February, 1801.

225. HEATING ROOMS FOR THE PURPOSES OF MANUFACTURERS. To the perſon who ſhall invent and diſcover to the Society a Method of Heating Rooms, ſuperior to any hitherto known or in uſe, and at a moderate expence, for the purpoſes of Painters, Japanners, and other Manufacturers, ſo as to avoid the neceſſity of iron or copper funnels going through the rooms to convey the ſmoke, whereby the danger from ſuch tunnels may be prevented; the GOLD MEDAL, or FORTY GUINEAS.

A Model, or complete Drawing and Deſcription of the Method, with CERTIFICATES that it has been ſucceſsfully practiſed, to be delivered to the Society on or before the laſt Tueſday in March, 1800.

Premiums

Premiums offered for the advantage of the British Colonies.

226. NUTMEGS. For the greateſt quantity of Merchantable Nutmegs, not leſs than ten pounds weight, being the growth of his Majeſty's dominions in the Weſt Indies, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, and equal to thoſe imported from the Iſlands of the Eaſt Indies; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

Satisfactory CERTIFICATES, from the Governor or Commander in Chief, of the place of growth, with an account of the number of trees, their age, nearly the quantity of fruit on each tree, and the manner of culture, to be produced on before the firſt Tueſday in December, 1799.

227. The ſame premium is extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in December, 1800.

228. CINNAMON. For importing into the port of London, in the year 1799, the greateſt quantity, not leſs than twenty pounds weight, of Cinnamon, being the growth of ſome of the Iſlands in the Weſt Indies belonging to the Crown of Great Britain, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, and equal in goodneſs to the Cinnamon brought from the Eaſt Indies; the GOLD MEDAL, or FIFTY GUINEAS.

SAMPLES, not leſs than two pounds weight, with CERTIFICATES that the whole quantity is equal in goodneſs; together with ſatisfactory CERTIFICATES, ſigned by the Governor, or Commander in Chief, of the place of growth, with an account of the number of trees growing on the ſpot, their age, and the manner of cul-

ture;

ture; to be produced to the Society on or before the firſt Tueſday in January, 1800.

229. CLOVES. For importing into the port of London, in the year 1799, the greateſt quantity of Cloves, not leſs than twenty pounds weight, being of the growth of ſome of the Iſlands of the Weſt Indies, ſubject to the Crown of Great Britain, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, and equal in goodneſs to the Cloves brought from the Eaſt Indies; the GOLD MEDAL, or FIFTY GUINEAS.

SAMPLES, not leſs than two pounds weight, with CERTIFICATES that the whole quantity is equal in goodneſs, together with ſatisfactory CERTIFICATES, ſigned by the Governor, or Commander in Chief, of the place of growth, with an account of the number of trees growing on the ſpot, their age, and the manner of culture, to be produced to the Society

on or before the firſt Tueſday in January, 1800.

230. The ſame premium is extended one year further.

SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1801.

231. PLANTATIONS OF BREAD-FRUIT TREES. To the perſon who ſhall have raiſed in any of the Iſlands of the Weſt-Indies, ſubject to the Crown of Great Britain, or in any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, between the firſt of January, 1798, and the firſt of January, 1799, the greateſt number of Bread-fruit Trees, not fewer than one hundred, and properly fenced and ſecured the ſame, in order to ſupply the Fruit to the Inhabitants; the GOLD MEDAL, or THIRTY GUINEAS.

Proper

Proper ACCOUNTS and CERTIFICATES, ſigned by the Governor, or Commander in Chief, of the methods made uſe of in cultivating the Plants and ſecuring the Plantation, and that the Trees are in a growing and thriving ſtate at the time of ſigning ſuch Certificates, to be produced to the Society, with Samples of the Fruit, on or before the firſt Tueſday in January, 1800.

232. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1801.

233. The ſame premium is extended one year further.

The ACCOUNTS and CERTIFICATES to be produced on or before the firſt Tueſday in January, 1802.

234. KALI FOR BARILLA. To the perſon who ſhall have cultivated, in the Bahama Iſlands, or any other part of his

Majeſty's dominions in the Weſt Indies, or any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto, in the year 1796, the greateſt quantity of land, not leſs than two acres, with Spaniſh Kali, fit for the purpoſe of making Barilla; the GOLD MEDAL, or THIRTY GUINEAS.

235. For the next greateſt quantity, not leſs than one acre, the SILVER MEDAL, or FIFTEEN GUINEAS.

CERTIFICATES, ſigned by the Governor, or Commander in Chief for the time being, of the quantity of land ſo cultivated, and of the ſtate of the Plants at the time of ſigning ſuch Certificates, to be delivered to the Society, with Samples of the Kali, on or before the ſecond Tueſday in November, 1799.

236, 237. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1800.

238.

238, 239. The ſame premiums are extended one year further.

CERTIFICATES to be produced on or before the ſecond Tueſday in November, 1801.

240. DESTROYING THE INSECT COMMONLY CALLED THE BORER. To the perſon who ſhall diſcover to the Society an effectual method of deſtroying the Inſect commonly called the BORER, which has of late years been ſo deſtructive to the Sugar-Canes in the Weſt-India Iſlands, or in any of the Britiſh Settlements on the Coaſt of Africa, or the ſeveral Iſlands adjacent thereto; the GOLD MEDAL, or FIFTY GUINEAS.

The Diſcovery to be aſcertained by ſatisfactory CERTIFICATES, under the hand and ſeal of the Governor or Commander in Chief for the time being, and of ſome other reſpectable perſons, inhabitants of the Iſlands, or other place, in which the remedy

has been ſucceſsfully applied; ſuch CERTIFICATES to be delivered to the Society on or before the firſt Tueſday in January, 1800.

241. The ſame premium is extended one year further.

CERTIFICATES to be delivered on or before the firſt Tueſday in January, 1801.

242. BOTANIC GARDEN IN THE BAHAMA ISLANDS. To the perſon who, before the firſt of January, 1799, ſhall have ſet apart, and, at his own private expence, ſhall have properly fenced and cultivated, the greateſt quantity of ground, not leſs than five acres, in any of the Bahama Iſlands, as a Botanic Garden, for the purpoſe of making experiments in the culture of thoſe articles which are the peculiar production of the tropical climates, and which may tend to promote the commerce and manufactures of this country; the GOLD MEDAL, or ONE HUNDRED GUINEAS.

It is required that any perſon claiming the foregoing premium ſhould produce to the Society, on or before the firſt Tueſday in January, 1800, a CERTIFICATE from the Governor or Commander in Chief of the Bahama Iſlands for the time being, of his having complied with the above requiſitions, and that the Garden is in a proper ſtate of culture at the time of ſigning ſuch Certificate.

Premiums

Premiums offered for the advantage of the Britiſh Settlements in the Eaſt Indies.

243. BHAUGULPORE COTTON. To the perſon who ſhall import into the port of London, in the year 1799, the greateſt quantity, not leſs than one ton, of the Bhaugulpore Cotton, from which clothes are made in imitation of Nankeen, without dying; the GOLD MEDAL.

A quantity of the Cotton, not leſs than five pounds weight in the pod, and five pounds carded, to be produced to the Society, with proper CERTIFICATES, ſigned by the Secretary to the Board of Trade of Bengal, on or before the laſt Tueſday in February, 1800.

244. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced to the Society on or before the laſt Tueſday in February, 1801.

245.

245. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced to the Society on or before the laſt Tueſday in February, 1802.

246. ANNATTO. To the perſon who, in the year 1799, ſhall import into the port of London, from any part of the Britiſh Settlements in the Eaſt Indies, the greateſt quantity of Annatto, not leſs than five hundred weight; the GOLD MEDAL.

A quantity of the Annatto, not leſs than ten pounds weight, to be produced to the Society, with proper CERTIFICATES, ſigned by the Secretary of the Board of Trade of the reſpective Settlement, that the Annatto is the produce of ſuch Settlement, on or before the laſt Tueſday in February, 1800.

247. The ſame premium is extended one year further.

The

The SAMPLES and CERTIFICATES to be produced to the Society on or before the laſt Tueſday in February, 1801.

248. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced to the Society on or before the laſt Tueſday in February, 1802.

249. TRUE COCHINEAL. To the perſon who, in the year 1799, ſhall import into the port of London, from any part of the Britiſh Settlements in the Eaſt Indies, the greateſt quantity of True Cochineal, not leſs than five hundred weight; the GOLD MEDAL.

A quantity of the Cochineal, not leſs than ten pounds weight, with proper CERTIFICATES, ſigned by the Secretary of the Board of Trade of the reſpective Settlement, that the Cochineal is the produce of ſuch Settlement,

ment, to be produced to the Society on or before the firſt Tueſday in February, 1800.

250. The ſame premium is extended one year further.

The SAMPLES and CERTIFICATES to be produced on or before the firſt Tueſday in February, 1801.

Society's Office, Adelphi, June 1, 1799.

Ordered,

THAT THE SEVERAL CANDIDATES AND CLAIMANTS TO WHOM THE SOCIETY SHALL ADJUDGE PREMIUMS OR BOUNTIES, DO ATTEND AT THE SOCIETY'S OFFICE IN THE ADELPHI, ON THE LAST TUESDAY IN MAY, 1800, AT TWELVE O'CLOCK AT NOON, TO RECEIVE THE SAME; THAT DAY BEING APPOINTED BY THE SOCIETY FOR THE DISTRIBUTION OF THEIR REWARDS: AND BEFORE THAT TIME NO PREMIUM OR BOUNTY WILL BE DELIVERED, EXCEPTING TO THOSE WHO ARE OUT OF THE KINGDOM, OR PREVENTED BY UNAVOIDABLE ACCIDENTS.

IN CASES WHERE THE SOCIETY MAY THINK FIT TO ADMIT EXCUSES FOR NOT ATTENDING IN PERSON, DEPUTIES MAY BE SUBSTITUTED TO RECEIVE THE REWARDS, PROVIDED SUCH DEPUTIES ARE EITHER MEMBERS OF THE SOCIETY, OR THE SUPERIOR OFFICERS THEREOF.

GENERAL

GENERAL CONDITIONS.

NOTWITHSTANDING the Society reſerve to themſelves the power of giving, in all caſes, ſuch part only of any Premium as the performance ſhall be adjudged to deſerve, or of withholding the whole, if there be no merit; yet the Candidates may be aſſured the Society will always judge liberally of their ſeveral Claims.

It is required that the matters for which Premiums are offered, be delivered in without names, or any intimation to whom they belong; that each particular thing be marked in what manner each Claimant thinks fit, ſuch Claimant ſending with it a paper ſealed up, having on the outſide a correſponding mark, and on the inſide the Claimant's name and addreſs: and all Candidates are to take notice, that no Claim for a Premium will be attended to, unleſs the conditions of the Advertiſement are fully complied with.

No

No Papers ſhall be opened, but ſuch as ſhall gain Premiums, unleſs where it appears to the Society abſolutely neceſſary for the determination of the Claim; all the reſt ſhall be returned unopened, with the Matters to which they belong, if enquired after by the Mark, within two years; after which time, if not demanded, they ſhall be publicly burnt, unopened, at ſome meeting of the Society.

All Models of Machines, which obtain Premiums or Bounties, ſhall be the property of the Society.

All the Premiums of this Society are deſigned for Great Britain, unleſs expreſsly mentioned to the contrary.

The Claims ſhall be determined as ſoon as poſſible after the delivery of the ſpecimens.

No perſon ſhall receive any Premium, Bounty, or Encouragement from the Society, for any matter for which he has obtained, or purpoſes to obtain, a patent.

A Candidate for a Premium, or a perſon applying for a bounty, being detected in any diſengenuous method to impoſe on the

the Society, ſhall forfeit ſuch Premium or Bounty, and be deemed incapable of obtaining any for the future.

The Performances which each year obtain Premiums or Bounties are to remain with the Society until after the public diſtribution of Rewards.

No member of this Society ſhall be a Candidate for, or entitled to receive, any Premium, Bounty, or Reward whatſoever, except the Honorary Medal of the Society.

Where Certificates are required to be produced in claim of Premiums, they ſhould be expreſſed, as nearly as poſſible, in the words of the reſpective advertiſements, and ſhould not be from the Candidate (ſolely), but from ſome other perſon or perſons who have a poſitive knowledge of the facts certified.

Where Premiums or Bounties are obtained in conſequence of ſpecimens produced, the Society mean to retain ſuch part of thoſe ſpecimens as they may judge ne-

ceſſary, making a reaſonable allowance for the ſame.

No Candidates ſhall be preſent at any meetings of the Society or Committees, or admitted at the Society's Rooms, after they have delivered in their Claims, until ſuch Claims are adjudged, unleſs ſummoned by the Committee.

N. B. Any information or advice that may forward the deſigns of this Society for the public good, will be received thankfully, and duly conſidered, if communicated by letter, addreſſed to the Society, and directed to Mr. MORE, the Secretary, at the Society's Office, in the Adelphi Buildings, London.

*** In caſe any perſon ſhould be inclined to leave a ſum of money to this Society, by will, the following form is offered for that purpoſe:

Item. I give and bequeath unto A. B. and C. D. the ſum of upon condition and the intent that they, or one of them, do pay the ſame to the Collector for the time being, of a Society in London, who now call themſelves the Society for the Encouragement of Arts, Manufactures, and Commerce; which ſaid ſum of I will and deſire may be paid out of my perſonal eſtate, and applied towards the carrying on the laudable deſigns of the Society.

By order of the Society,

SAMUEL MORE, Secretary.

PAPERS IN AGRICULTURE.

AGRICULTURE.

THE Thanks of the Society were this Seſſion voted to NATHANIEL KENT, Eſq. for the following Communication; and he was deſired to make the due acknowledgments of the Society to HIS MAJESTY, for having been graciouſly pleaſed to permit ſo full and exact an Account of the Improvements on the Farm in the Great-Park, at Windſor, to be tranſmitted to the Society, whereby ſo much benefit is likely to accrue to the Public.

SIR,

UPON mentioning to you ſome time ſince, that there had been ſome practices in Huſbandry, on his Majeſty's Farms under my ſuperintendance in Wind-

ſor Great Park, which I conceived were not generally known; and upon your giving me reaſon to think the Society for the Encouragement of Arts, &c. from its laudable deſire to communicate to the Public every thing that promiſes advantage to it, would not be unwilling to allow me a few pages in its next publication; and being indulged with His Majeſty's gracious permiſſion, to ſtate any matter that I may diſcretionally judge proper to communicate; I am induced to lay before you a few particulars, which ſome Gentlemen and Farmers, under ſimilar circumſtances, may perhaps think deſerving notice.

But before I enter upon any particular deſcription of what I have to offer, it will not, perhaps, be unintereſting to the Society, to know the grounds upon which His Majeſty's large ſyſtem of Agriculture has been founded.

In the year 1791, the Great Park at Windſor, about 4000 acres, fell into His Majeſty's poſſeſſion. It might truly be called

called a rough jewel. The whole, as a natural object, was grand and beautiful, of a foreſt appearance; but the parts were crowded and indiſtinct. The ſoil was various, ſome parts clay and loam, and ſome ſharp gravel or poor ſand; a great part of the former was covered with ruſhes and mole-hills, and the latter with fern and moſs.

About 1000 acres of the lighteſt part were ſeparated from the reſt at one extremity, and formed what is called the Norfolk Farm: about 400 acres more, at the other extremity, of a good loamy ſoil, were ſeparated, and called the Flemiſh Farm, both being named from the nature of the huſbandry meant to be adopted upon them.

The reſt (about 2,400 acres) remains ſtill in Plantations and Park; and though ſo much reduced, yet, from the improvements which have been made upon it, is now capable of carrying more ſtock than the whole 4000 acres did before. All the unſound wet parts have been drained by the Eſſex mode, ſo as to be rendered firm,

and

and productive of an improved herbage. The mole-hills have been levelled, chiefly by dragging, and the coarſe and moſſy parts fined by repeated harrowing and rolling, (being one of the firſt improvements upon Park Land of this deſcription); beſides which, a variety of beauty has been laid open, by clearing the valleys and low parts, to give a bolder effect to the woody ſcenes upon the higher ground; and by making judicious openings, ſo as to break ſtrait lines, and ſeparate parts that were in ſome places too heavy and ſamely: ſo that the ſame extent of land has now not only a much larger appearance, but exhibits a much greater variety of ground. The truth of this, every impartial perſon who knew the place before His Majeſty cauſed theſe improvements to be made, muſt allow. I have only to add, that though prejudice may have taken up an idea that there has been too great a ſacrifice of timber in effecting theſe improvements, truth will deny it. There has not been a tree taken down,

but

but what was either in decay, or removed either to give room for the growth of others, or to ſet them off to greater advantage in pictureſque appearance.

I come now to the object in view, as before hinted, which is to ſtate the motives which I am inclined to think induced His Majeſty to adopt the farming ſyſtem upon ſo large a ſcale, and next to ſhew the reſult.—Theſe I conceive were chiefly to create uſeful labour for the induſtrious poor in the neighbourhood, and for trying experiments in Agriculture, to excite imitation where ſucceſs might encourage it.

The Norfolk Farm borders on that extenſive waſte called Bagſhot-heath, hitherto conſidered too barren for cultivation, though large tracts of a ſimilar quality have been long ſince rendered uſeful to the community in the ſouth-weſt part of Norfolk. Arable land of this deſcription is generally managed there under a five-courſe ſhift; firſt, wheat; ſecond, turneps; third, barley with ſeeds, which continue laid two years.

But

But as the ſeeds turn to very little account after the firſt year, His Majeſty's, which though a five-courſe ſhift likewiſe, of one hundred acres in a ſhift, is upon a much improved courſe of cropping; as thus—firſt, wheat or rye; ſecond, the irregular ſhift; third, turneps; fourth, barley or oats; fifth, clover.—The irregular ſhift, which is of great uſe on a light land farm, may perhaps want a little explanation. It is meant to be partly productive, and partly preparative. Forty acres of it are ſown with vetches, to be fed off; forty are ſown the latter end of Auguſt with rye, for early feed the next ſpring for the ewes and lambs; the remaining twenty acres are planted with potatoes, and the whole comes round for turneps the next year.

From the advantage of running ſheep in the Park, this Farm has been brought ſurpriſingly forward, conſidering the ſhort time it has been cultivated; and a great part of it, which produced nothing but heath and moſs, and would have been dear

at

at five ſhillings an acre to rent, now produces crops worth more than the original fee-ſimple of the land.

Brevity checks me from going farther into a general deſcription; but the following particulars may deſerve notice.

The comparative advantages of the labour of Horſes and Oxen have been for ſome time under the conſideration of the Public. His Majeſty has unqueſtionably tried the latter upon a larger ſcale than any other perſon, as he does not work leſs than one hundred and eighty Oxen upon his different farms, parks, and gardens, and has found them to anſwer ſo well, that there is not now a horſe kept.—Upon the two Farms, and the Great Park, two hundred are kept, including thoſe coming on and going off. Forty are bought in every year, riſing three years, and are kept as ſucceſſion oxen in the Park; one hundred and twenty are under work; and forty every year are fatted off, riſing ſeven years.

The

The working Oxen are moſtly divided into teams of ſix, and one of the number is every day reſted, ſo that no ox works more than five days out of the ſeven.—This day of eaſe in every week, beſides Sunday, is of great advantage to the animal, as he is found to do better with ordinary keep and moderate labour, than he would do with high keep and harder labour. In ſhort, this is the firſt ſecret to learn concerning him; for an ox will not admit of being kept in condition like a horſe, artificially, by proportionate food to proportionate labour.

Theſe Oxen are never allowed any corn, as it would prevent their fatting ſo kindly afterwards. Their food in ſummer is only a few vetches, by way of a bait, and the run of coarſe meadows, or what are called leaſows, being rough woody paſtures. In winter they have nothing but cut food, conſiſting of two thirds hay, and one third wheat-ſtraw; and the quantity they eat in twenty-four hours is about twenty-four pounds of hay and twelve of ſtraw: and on the

the days of reſt, they range as they like in the ſtraw-yards; for it is to be obſerved, that they are not confined to hot ſtables, but have open ſheds, under which they eat their cut provender, and are generally left to their choice to go in and out. Under this management, as four oxen generally plough an acre a day, and do other work in proportion, there can be no doubt but their advantage is very great over horſes, and the reſult to the public highly beneficial.

The Oxen which are brought on in ſucceſſion, run the firſt ſummer in the Park, and in the leaſows and temporary ſtraw-yards in the winter; by which temporary ſtraw-yards, I would have it underſtood, that they are made in different places, ſo that the manure which they make may be as near to the ſpot where it is wanted as poſſible.

The forty Oxen which go off are ſummered in the beſt paſture, and finiſhed with turneps the enſuing winter.—The uſual way has been to draw the turneps, and to give

give them either ſtalled or in cribs placed in the yard, with plenty of ſtraw to browſe and lie upon: but laſt winter an experiment was tried, which anſwered extremely well, and will be again repeated next winter: this was, penning the oxen by day upon the turnep-land, in the manner that ſheep are penned, with this only difference, that the turneps were thrown up into cribs, inſtead of being left to be trodden into the ground; and in the nights they were driven into a yard, with a temporary ſhed well littered with ruſhes, fern, and leaves, and turneps and barley-ſtraw given to them in cribs. They thrived very faſt, and every one of them made at leaſt eight loads of good muck in the night-yard, beſides the benefit done in treading and dunging on the land in the day-time, which was very great, the ſoil being very light.—The reſult of the Ox ſyſtem is, that charging the ox for his agiſtment the firſt year, for the value of the graſs and turneps the laſt year, and putting what he has in three intermediate

mediate years as an equivalent for his labour, after every allowance for riſk, each Ox will pay at leaſt twenty per cent. profit. —In what inſtance does a horſe produce ſo much?

I do not allow that the Ox can be uſed on all ſoils; upon a very ſtony ſoil he cannot: nor can the horſe in all places be wholly excluded from Huſbandry; but every occupier of a large farm may at leaſt uſe ſome Oxen to very great advantage. They are all worked at Windſor in collars, as their ſtep is found to be much more free than when coupled together with yokes; and they are found to do their work with much greater eaſe in collars than in yokes, which ought every where to be exploded.

The different kinds of Oxen are in ſome meaſure ſuited to the ſoil.—Upon the Norfolk Farm, which is a light ſoil, the Devonſhire ſort are uſed; upon the Flemiſh Farm, where the ſoil is ſtrong and heavy, the Herefordſhire; and in the Park, where the buſineſs is carting, harrowing, and

rolling, the Glamorganſhire.—They are all excellent in their different ſtations.

It may not be improper to mention a very ſimple method which has been diſcovered, of firſt training them to the collar, which is nothing more than putting a broad ſtrap round their necks, and faſtening one end of a cord to it, and the other to a large log of wood, and letting the Ox draw it about as he feeds in his paſture, for three or four days, before he is put into harneſs, by which means he is very much brought forward in docility.

I have before obſerved, that twenty per cent. may be conſidered as the average profit of an Ox; ſtating them to be bought in at £.10, and allowing them to ſell for £.25, taking off £.10 for the two years they are not worked: but laſt year beans being of very little value, they were kept longer than uſual, by being ſtall-fed with bean-meal, which anſwered very well, as they were brought to an average of nearly £.30; and one of them, a Glamorganſhire

morganſhire Ox, originally bought for £.8, and, from his compact round make, always called the Little Ox, thrived to ſuch a ſurpriſing degree, that he became too fat to be able to travel to Smithfield, and was therefore ſold to Mr. Charlwood, a neighbouring butcher, for £.47.

Next to the advantage obtained from oxen, as much benefit as poſſible has been endeavoured to be derived from ſheep, by means of the fold.—Two ewe flocks are kept, of four hundred each: the ſoil being light and dry, admits of winter-folding (except when the weather is wet), upon the young clover;—a practice much to be recommended, as it is productive of a great crop of clover, and prepares the land the enſuing autumn for a crop of wheat, without any further aſſiſtance. Another excellent practice is folding upon light land, in dry weather, immediately upon the ſowing of the wheat, which may be put forward, or kept back, a fortnight or three weeks, on that account; and it is not amiſs

to have the fold rather large, and to give the ſheep a turn or two round the fold in a morning before they are let out, to tread and ſettle the land, which does a great deal of good, over and above their dung.

A third method of folding has been found to anſwer almoſt beyond deſcription. This was firſt tried in the winter of 1793; but from an idea of the ſhepherd, that it injured the ſheep, has been ſince diſuſed: but as there is good reaſon to believe that there was no juſt ground for ſuch an opinion, it is meant to be revived next winter.

A dry ſheltered ſpot is ſelected, and ſods of maiden earth, a foot deep, are laid over the ſpace of a very large fold. It is then bedded thinly with ruſhes, leaves of trees, fern, moſs, ſhort ſtraw, or ſtubble; and in hard or wet weather, the flock, inſtead of being penned upon the clover in the open fields, is put into this warmer fold, where the uſual quantity of hay is given to them in racks; and every night they are ſo penned, the fold is freſh littered. When this has been

been continued, at intervals, during the winter, a layer of lime, chalk, rubble, or aſhes, ſix inches thick, is ſpread over the whole ſurface—and when it has heated together, about the month of April, the whole is turned up, and mixed together, and makes the very beſt manure that can be uſed for turneps.

I have been particular in deſcribing theſe methods of folding, as they are not common in any place, and in others entirely unknown, and to Gentlemen who have parks and large plantations which afford abundance of leaves, this hint may be the more deſerving attention.

Upon the Norfolk Farm the land not having been yet marled or clayed, the clover is apt ſometimes to fail, which is alſo the caſe elſewhere, upon the ſame ſort of land. When this happens, His Majeſty does what every other perſon in a ſimilar ſituation ſhould do; inſtead of letting the ground remain unproductive, the next year it is ſowed with vetches, which are nearly

as valuable as the clover, and wheat always grows remarkably kind after them.

As to implements, the Norfolk plough is chiefly what is uſed; and upon a light ſoil, it is certainly preferable to any other. It ploughs a cleaner furrow, by completely moving the whole body of earth, and inverts it much better than any other plough; and to eſtabliſh its ſuperiority over the common ploughs of the neighbourhood, I need only add, that from its conſtruction it is nearly the draught of an ox eaſier. There is likewiſe a Norfolk harrow, very uſeful for harrowing what are called bruſh-turneps, or any other turneps, preparatory to their being hoed.—I muſt be allowed, likewiſe, to mention the drill-roller, which conſiſts of caſt-iron rings, made at the Norwich Foundery, and ſlipt on upon a round piece of wood, as an axle-tree. This is one of the beſt things that has ever been introduced, for the preparation of the land for any ſort of corn, where the ſoil will admit of its being uſed.

By

By the corn being ſo well depoſited, it takes better root, and at leaſt one fourth of the quantity uſually ſown may be ſaved.

The Flemiſh Farm, which I have before mentioned, was ſo named from an intention, at firſt, of carrying on a ſyſtem of huſbandry ſimilar to that practiſed in Flanders, which conſiſts of an alternate crop for man and beaſt; but the ſoil being ſtrong and coheſive, upon trial, it has been found to anſwer beſt under a four-courſe ſhift, more like ſome parts of Glouceſterſhire; as thus—firſt year, wheat; ſecond, cabbage or clover; third, oats; fourth, beans.—The quantity of arable land on this Farm is one hundred and ſixty acres, or forty acres in a ſhift. There are two things obſerved upon this Farm, which may be worth notice:—The firſt is the practice which has for theſe two years paſt been adopted, by taking off the tops of the beans juſt as the bloſſom is ſet; this not only improves the quality, but increaſes the quantity, and cauſes them to ripen ſooner, which is a

conſiderable advantage, by giving time to get the ſucceeding crop of wheat in perhaps a fortnight earlier. The other is, that of ſowing clover early in the ſpring, among twenty acres or one half of the wheat, and buſh-harrowing and rolling it in. This has produced a very fair crop of clover the next year; and the other half, after the wheat, is winter and ſpring fallowed, and planted with cabbage. There is a double advantage reſulting from this; that one half of this ſhift, ſo managed, becomes a ſummer crop, and the other half a winter crop; and by obſerving the next year to change the parts, by ſowing the clover where the cabbage was before, the clover and cabbage do not come round upon the ſame ground but one in eight years.

Cabbage has been tried ſeveral years, but His Majeſty's huſbandmen never got into the right management of it till this year; but now the crop is remarkably fine.

It

It will not be improper to mention, that the drum-headed cabbage is the beſt ſort; that the ſeed ſhould be ſown in Auguſt, the plants firſt ſet out in November, and tranſplanted for good in July. The next thing to be noted is their application:—They are certainly inferior to turneps for fatting, but ſuperior in the increaſe of milk, either of cows or ewes, and therefore they are particularly good where there is a dairy or a breeding flock of ſheep: and I truſt His Majeſty will, the next yeaning ſeaſon, try an experiment, of which I have high expectation, which is to ſlice or quarter the cabbage, and feed the ewes with them upon ſuch of the meadows as want manuring, which I flatter myſelf will be of ineſtimable ſervice to the ewes and lambs, and be the means of increaſing the next years crop of hay conſiderably.

The true light of viewing theſe improvements is to conſider them as a ſort of new creation to the public; for, as it is a fact not to be controverted, that the reduced

duced number of acres in the Park, from their improved ſtate, ſupport as many deer and other cattle as the whole did before, the produce obtained from the Farms is all clear gain; and as the crop of wheat and rye from the 140 acres ſown, upon the moſt moderate calculation, may be ſet at 3,360 buſhels, and allowing ſix buſhels to a human mouth, this gives a yearly proviſion in bread for 560 people; to ſay nothing of the fatting-off of forty oxen, the breed of 800 ſheep, and the growth of at leaſt 5000 buſhels of oats and beans; all of which, it muſt be obſerved, goes in aid of the public market, as the work is done by Oxen entirely.

As more experiments are in future made, I may perhaps trouble the Society with an account of them, as I am perſuaded they cannot be regiſtered any where elſe, to give them the credit, and to excite the imitation I flatter myſelf they may deſerve: but for the preſent, I ſhall cloſe my obſervations upon His Majeſty's Farms, with a deſcrip-

tion

tion of his Mill, which I conſider as the moſt benevolent thing that can be done for the Poor, and which I moſt earneſtly recommend to all Gentlemen of landed property, who have like means of doing it. A ſmall Over-ſhot Mill is erected, and worked by the waſte water from the lake below the Lodge, where a ſufficiency of corn, two thirds wheat and one third rye, is ground, dreſſed, and given to all the labourers, at ſixteen pence per ſtone of fourteen pounds, in quantities ſuitable to the ſize of their families, which is the firſt of all comforts to them, and a ſaving of at leaſt twenty per cent. from what it would coſt them to buy it from the mealmen or ſhopkeepers.

I am, SIR,
Your obedient humble ſervant,
NATHANIEL KENT.

Craig's Court,
30th October, 1798.

Mr. MORE.

The

The GOLD MEDAL, or THIRTY GUINEAS, at the option of the Candidate, being the Premium offered for PLANTING OZIERS, was this Seſſion adjudged to THOMAS PAGE, of Ely, Eſq. from whom the following Accounts and Certificate were received, and who made choice of the Honorary Reward.

SIR,

SEEING in the yearly publication of the Society for the Encouragement of Arts, Manufactures, and Commerce, an account of the Premiums offered by the Society to the perſon who ſhall plant the greateſt number of acres with Oziers in the year 1798, I beg leave to inform the Society what I have done this year. In the months of March and April laſt, I planted ſeven acres and a half of the various Oziers fit for the purpoſe of baſket-making, conſiſting of the Ozier, Spaniard, New-kind,

and

and a great deal of what is called in this part of the country the laſt *new kind*, not leſs than thirteen thouſand to the acre, and on ſome acres conſiderably more than fourteen thouſand.

For my Certificate of their planting, and that they are in a thriving ſtate, I beg leave to refer you to John Phillips, Eſq. of Ely, of whom I had the ſets, and partly under whoſe direction and advice, he having practiſed a great deal, I did the planting.

Should the Society deem that what I have done entitles me to their Honorary Reward, I ſhall think myſelf highly flattered by ſuch a mark of their approbation.

I am, SIR,

Your moſt obedient ſervant,

THOMAS PAGE.

Ely,
Nov. 15*th*, 1798.

Mr. MORE.

I JOHN PHILLIPS, of Ely, Member of the Society inſtituted at London for the Encouragement of Arts, Manufactures, and Commerce, do certify, that the account given by Thomas Page, Eſq. and herewith tranſmitted to you, of the Ozier Plantations made by him in the months of March and April laſt, is true. The ſets were furniſhed by me, becauſe the other Planters either had not or would not part with any of the beſt ſorts. About four acres were planted with the two ſorts of New-kind and Weſt-country Spaniard; and the remainder with the common Spaniard, the Red Welch, and four or five varieties of the common Ozier. They are well guarded by ſufficiently wide and deep ditches, and have been kept very clean from weeds. They are not vigorous, but they are as flouriſhing as any that I have ſeen this year. All the young Plantations have ſuffered much by what is commonly called the *blight*, but which is none other than a ſmall brown fly, that feeds upon

upon the opening bud, and whoſe young, generated between the bud and the bark, afterwards devour the leaves and ſhoots. Mr. Page has ſpared neither trouble nor expence in their proper care and management; and if the ſoil, which is a black peat, is ſufficiently ſtrong to carry them, I have no doubt but they will recover from the ravages of the fly, by the aid of a a copious ſupply of water next ſummer, for which he has made proviſion, by laying a tunnel to convey it from the river to the plantations.

Ely,
Nov. 25th, 1798.

SAMUEL MORE, Eſq.

TWENTY GUINEAS, being the Premium offered for the Culture of BEANS and WHEAT, was this Seſſion adjudged to Mr. ROBERT DUDGEON, of Tynningham, from whom the following Papers were received.

SIR,

HAVING been in the practice of ſowing Wheat after drilled Beans, I take the liberty of laying before the Society for the Encouragement of Arts, Manufactures, and Commerce, an account of three fields, containing nearly twenty-three and a half acres (Engliſh ſtatute meaſure), drilled with Beans in the ſpring of 1797, and ſown with Wheat the ſame year.

One hundred and twenty-ſix buſhels of Tick Beans were ſown, which, at an average, is five buſhels one peck and a half of ſeed per acre. The total produce was one hundred and thirteen quarters, five buſhels,

buſhels, and three pecks; that is, thirty-eight buſhels, three pecks, per acre, average produce.

The field marked N° 1 in the ſurveyor's certificate, containing 8.26. acres, is part ſtrong red clay, upon a limeſtone bottom, and part a mixed ſoil of clay and loam, upon the ſame bottom; but the ſoil is of a greater depth. This field was twice ploughed. The firſt furrow was given in October, 1796. In February, 1797, it was dunged at the rate of ſixteen cart-loads per acre (containing from fourteen to ſixteen hundred weight each), and immediately got a ſecond ploughing, the beans being drilled into the bottom of the furrow, behind the plough. Two acres and a half were drilled at the diſtance of every third furrow, making an interval of twenty-four inches between the rows; but this being too wide, the remaining part of the field was drilled at the diſtance of two furrows, making eighteen inches width between the rows. The ſame quantity of

ſeed per acre, viz. five buſhels and three pecks, was ſown in both caſes; and at harveſt, no apparent difference could be obſerved in the crop. The beans were drilled on the 27th and 28th of February, and the 1ſt of March, and the field completely harrowed. Some days afterwards, having had a froſt, which made the ſoil crumble and fall, it was harrowed a ſecond time, to reduce the mould to as fine a ſtate as poſſible.—This field was reaped on the 6th, 7th, and 8th of October; and once ploughed and ſown with wheat on the 10th and 11th of November, 1797. The produce of beans was forty-ſeven quarters, or forty-five buſhels two pecks per acre.

The field N° 2, containing 10.88. acres, is part clay, the ſame as N° 1, upon a limeſtone bottom, at a conſiderable depth, and part a light deep gravelly ſoil, with a ſubſoil of red clay. It was twice ploughed, firſt in October, 1796, and laſtly in February, 1797, immediately after which it was formed into ribs of twenty

inches

inches width, by making the horſe on the left-hand ſide of the plough* go in the laſt drawn furrow. The beans were drilled between theſe ribs on the 2d, 3d, and 11th of March, and covered by harrowing firſt along the drills, and then acroſs with a common harrow, till the ſurface was perfectly flat and the mould fine, the beans being left at a depth of four inches.—The quantity of ſeed per acre was five buſhels. This field was reaped on the 4th, 5th, and 6th of October; dunged on the bean ſtubble, at the rate of fifteen cart-loads per acre; once ploughed, and ſown with wheat, on the 13th, 14th, and 22d of November, and the 21ſt of December, 1797. The produce of beans was fifty-one quarters, four buſhels, or thirty-ſeven buſhels, two pecks, per acre.

The field N° 3, containing 4.22. acres, is a light gravelly ſoil, upon a ſubſoil

* In this county, we plough with two horſes only, which are yoked abreaſt, and go without a driver.

of ſand mixed with ſmall gravel. It was twice ploughed, firſt in October, 1796, and laſtly in February, 1797. It was afterwards ribbed in the ſame manner as N° 2, and the beans drilled on the 16th and 17th of March, at the rate of five buſhels two pecks per acre, and covered by harrowing the ſame as N° 2. This field was reaped on the 21ſt of September, and one half of it ploughed. It was then dunged at the rate of eighteen cart-loads per acre, and the whole field ploughed over, and ſown with wheat on the 28th of December, 1797. But the crop of wheat upon that part of the field which got two furrows, was much inferior to that where it got only one; which ſhews the impropriety of looſening ſoils of this quality by repeated ploughing, particularly where the ſubſoil is ſo little calculated for the retention of moiſture. The produce of beans upon this field was fifteen quarters one buſhel, or twenty-eight buſhels two pecks, per acre.

Remark.

Remark.—The ſuperior produce of field N° 1, is not to be attributed to its being drilled in a different manner from N° 2 and 3, but to its being dunged previous to the bean crop, and to the froſt happening ſo opportunely after drilling for getting the mould brought to a fine ſtate. Indeed, the mode of drilling purſued in this field, is what I never practice, but where local circumſtances prevent the other from being adopted: for, if the furrows are taken ſo as to ſtir the ſoil to a proper depth, the ſeed is then laid at too great a diſtance from the ſurface; in which caſe it generally ſends up a weak plant. And if ſuch a furrow is only taken as will place the ſeed at a proper depth, the bottom ſoil is then left unſtirred, whereby the paſture of the plant is greatly circumſcribed. The tap root may indeed penetrate the ſubſtratum, but the ſmall lateral fibres are prevented from ſpreading as they ought to do.

The drill employed was the common hand-drill uſed in this county, which

is puſhed along by two handles, like a wheelbarrow, and ſows one row at a time. The wheel is about twenty-two inches diameter, of ſolid deal, upon the axle of which is alſo fixed a notched roller of two inches and three quarters diameter, and two inches long, which turns in the fore part of the drill-box.—The quantity of ſeed is regulated by a ſlider, which moves up and down in the fore part of the box, by an adjuſting ſcrew fixed at top; the ſlider having a ſtrong bruſh projecting from its lower end, which ſweeps upon the notched roller. There is alſo a ſluice or ſlider that lies flat upon the bottom on the inſide of the drill-box. This ſlide projects between the two handles of the drill, ſo as to be within reach of the perſon that guides it; who, by puſhing the ſlide forward, completely covers the notched roller, and prevents any of the beans getting out while the drill is turning at the end of the ridges. A woman or boy will drill from two to two acres and a half per day, when the rows are at twenty inches diſtance.

All

All the fields were harrowed into a fine mould after ſowing; and when the beans had got above the ground, and the firſt leaves were fairly opened and green, they were again harrowed with a common harrow, which deſtroyed a crop of annual weeds, and ſaved a great deal of hand-weeding. The bean, at this ſtage of its growth, is poſſeſſed of a toughneſs that prevents it from receiving any injury by the harrow, provided the land has been previouſly brought to a fine mould, and the operation performed in dry weather. But if the ſurface is rough, the young plants are in danger of being covered by the clods; and if the harrowing is given at an earlier period, before the leaf has acquired a green colour, the bean is then in ſo tender a ſtate as to be broken and deſtroyed by the harrow.

Horſe-hoeing.—The intervals were horſe-hoed at the proper ſeaſon with a ſmall plough, which is ſo conſtructed as to prevent any of the mould falling to the left-

hand ſide. This plough was run cloſe alongſide of one row, by which the mould was turned over to the root of the next. The whole having been gone over in this way, making one furrow in each interval, the fields were allowed to lie in that ſtate for a week, in order to give the weeds time to wither. The hoeing was then reverſed, and the mould turned back again to the other ſide, which completely deſtroyed every weed between the rows.

Expence of Cultivation, per Acre.

	s.	*d.*	
Each ploughing, -	5	3	per acre.
Ribbing, - -	3	2	ditto.
Sowing, - -	3	2	ditto.
Covering the ſeed,	1	8	ditto.
Harrowing to kill weeds, -	1	0	ditto.
Horſe-hoeing, - -	3	0	ditto.
Hand-weeding, -	2	4	ditto.

Application

Application of the Straw.—The bean ſtraw was uſed as fodder for the working horſes in winter; for which purpoſe it is fully equal to pea ſtraw, commonly uſed in this part of the country; and when it is well got, the horſes are fonder of it than they are of pea ſtraw.

The ſeed-wheat, ſown after the twenty-three acres and a half of drilled beans before mentioned, was raiſed by me from a ſingle grain; the produce of which, viz. five hundred and forty grains, I planted in the ſpring of 1793. In the ſpring of 1794 I planted the returned produce upon a clover lay, after once ploughing, in rows twelve inches wide, and four inches between the plants, two grains being put into each hole; but from being planted in the ſpring, and a great drought following, the return was very ſmall. This produce was ſown broad-caſt, in the ordinary way, and produced, in 1795, twelve buſhels three pecks. This was likewiſe ſown in the ſame manner, and produced, in 1796, fifteen quarters; which being

being alſo ſown broad-caſt, produced, in 1797, more than I had occaſion to uſe as ſeed that ſeaſon.

I have for ſome time practiſed the raiſing of my ſeed-corn from the produce of a ſingle grain, picked while growing in the field, and find it a conſiderable improvement, as it equalizes the period of ripening, and produces a better ſample at market, the grain being all nearly of a ſize.

As the Society wiſh for accounts of wheat ſown after drilled beans, I take the liberty of ſtating (in addition to the above) the following crops, which I have raiſed in that rotation.

In 1792 I drilled forty-ſix acres with beans from the 14th to the 28th of March, the land being all ribbed at twenty inches wide, after being moſt of it twice ploughed; the crop was reaped from the 22d of September to the 16th of October, but the extreme wetneſs of the ſeaſon prevented the beans being cleaned off the land till the 10th of November, which was ſown with

wheat

wheat from the 18th of February to the 14th of March, 1793.

In 1793 I drilled ſixteen acres and a quarter with beans; in 1794, twenty-ſix acres and a quarter; in 1795, twenty-one acres and a quarter; and in 1796, three acres, all which were followed by wheat in their reſpective years. And the bean-ſtraw of theſe ſeveral crops was uniformly applied as fodder for the working horſes.

As the early ſeaſon at which beans are generally ſown, prevents the ſoil from being ſo well prepared as for the later ſown ſpring grains,—in order to aſcertain how late they would admit of being ſown, I drilled a buſhel ſo late as the 19th of April in 1792. The crop was reaped on the 16th of October, and produced twelve buſhels two pecks; but the grain was of an inferior quality.

We have a ſpecies of pea in this county, which admits of being ſown ſo late as the month of May, and ripens at the uſual ſeaſon. If a bean with the ſame properties could be procured, it would be a moſt

deſirable

desirable acquisition ; as the land would be so completely prepared before the time of sowing, that with proper horse-hoeing the bean fields would be as clean and fit for wheat as a complete summer fallow.

The procuring a species of bean possessing such qualities, would be an enquiry not unworthy of a Society so eminent for their patriotic exertions in the improvement of the country.

Hoping the Society will excuse the freedom I have used, in taking up so much of their time with these additional statements,

I am, SIR,

Your very humble servant,

A PRACTICAL FARMER.

Mr. MORE.

THIS is to certify, That I have measured the under-mentioned fields, belonging to Robert Dudgeon, Farmer, in Tynningham, in the parish of Whitekirk, and county of Haddington, and find the contents of each to be as follows, viz.

N° 1.

N° 1.	Chalk Park - -	8.26 acres
2.	Draper's ditto - -	10.88
3.	Redhugh Brae Park	4.22
	Amount in Engliſh meaſure	23.36 acres

The above meaſure includes only the arable part of each field.

To my certain knowledge theſe fields were in drilled beans crop 1797, and ſown with wheat the ſame year.

WILLIAM DICKINSON,
Land-Surveyor.

WE, George Meickle, Farmer, in the Knows Milln, and W. Hunter, Farmer, of Knows, pariſh of Whitekirk, do hereby certify, that Mr. Robert Dudgeon, Farmer, of Tynningham, in the pariſh of Whitekirk and county of Haddington, drilled in the month of March, 1797, twenty-three acres and a half nearly

nearly of land with beans, and ſowed the ſame with wheat the end of the ſame year, 1797.

As witneſs our hands, this 18th day of October, 1798,

GEORGE MEICKLE,
WILLIAM HUNTER.

SIR,

THE within certify my having drilled twenty-three acres and a half of land with beans, in three fields, in 1797, and ſowed the ſame with wheat the end of the ſame year, as ſtated in the account accompanying this, marked "An Account of twenty-three acres and a half of land drilled with beans in 1797, and ſowed with wheat the ſame year."

I am, SIR,
Your humble ſervant,
ROBERT DUDGEON,
Farmer, Tynningham, near Dunbar.

Mr. MORE.

SIR,

I WAS favoured with yours of the 21ſt, wiſhing to be informed if I had ſubſcribed as witneſs to a certificate of Mr. Robert Dudgeon, of Tynningham, near Dunbar. In anſwer to which, I did ſubſcribe to a certificate of Mr. Robert Dudgeon having ſown twenty-three acres thirty-ſix hundred parts of one acre with beans, in the year 1797, and having ſown the ſame land with wheat in the ſame year.

Your moſt humble ſervant,

GEORGE MEICKLE.

Knows Mill,
Nov. 24, 1798.

Mr. MORE.

The

The GOLD MEDAL or THIRTY GUINEAS, being the Premium offered for POTATOES for feeding CATTLE and SHEEP, was this Seſſion adjudged to Mr. WILLIAM SEATON, from whom the following Account and Certificate were received. Mr. Seaton made choice of the Pecuniary Reward.

An Account of the Expence of cultivating ſix acres of Land for, and planting the ſame with, Potatoes, and of the produce and value thereof for feeding Cattle, by Mr. William Seaton, of Tilgate, in the pariſh of Worth, in the county of Suſſex, and for which he begs to lay in his claim for the Premium offered by the Society for the Encouragement of Arts, Manufactures, and Commerce.

THE land had been lately incloſed from a rabbit-warren, called Tilgate Foreſt, near Crawley in Suſſex, which was denſhired, and one crop of oats taken from it; but the crop was ſo indifferent, that

that the land was thought not to be worth the expence of cultivation, and, on that account, was again thrown open to the warren, and fed upon by the rabbits for two years. In October, 1796, it was again incloſed and ploughed up. It lay fallow till the middle of March, 1797; it was then harrowed, and in a few days afterwards croſs-ploughed. It remained in that ſtate till the firſt week in April, when it was again harrowed, and in a few days afterwards ploughed a third time; and in about ten days more, it was harrowed a third time, and laid up in ridges for the reception of dung. Twelve cart-loads of very indifferent fold yard dung (not worth more than two ſhillings per load), were then laid upon it; and before the 25th of April twenty buſhels per acre of potatoes, of a mixed kind, were planted upon it. In the month of June the land was once hoed, and the potatoes earthed up.—In October the potatoes were taken up by the plough, and produced rather more than two hundred and

fifty buſhels per acre. This crop was applied as follows:

Feeding one cow, from the 1ſt of December, 1797, to the 15th of March, 1798, when the cow was killed, for the uſe of William Seaton's family; ſhe was not worth more than £.8 when put up to fatten, but fattened remarkably kindly, and when killed was well worth £.20. It alſo ſupported well eight ſtore pigs of four months old, one two-year old bull, ſixteen yearly calves, one cow and calf, and three milch cows (who ate at leaſt half a buſhel each per day), from the 1ſt of November to the 1ſt of April, and three heifers in calf from the 13th of February to the 10th of April. The remaining two hundred and eighty buſhels were kept for ſeed, and planted upon fourteen acres of warren land, *without dung* (of which an account will be given to the Society next year). The expence of raiſing, and the application of this crop on the ſix acres of land, are as follow.

Expences.	£.	s.	d.	*Value of Produce.*	£.	s.	d.
Three ploughings, at 3s. per acre each time, the ground being light	2	14	0	Fatting one cow 105 days, at leaſt 2 buſhels per day, well worth	10	10	0
Three harrowings, at 1s. per acre	0	18	0	*N. B.* She improved 12l. at leaſt			
Ridging up and covering the potatoes, 4s. per acre	1	4	0	Feeding 8 ſtore-pigs 21 weeks, at 1s. per week each	8	8	0
Dung, 12 cart-loads per acre, at 2s. each	7	4	0	Ditto one 2-years old bull, at 3s. per week	3	3	0
Carting and ſpreading, 1s. per acre	3	12	0	Ditto 16 yearly calves, at 1s. 6d. each per week	25	4	0
Potatoes, 20 buſhels per acre, at 1s.	6	0	0	Ditto 1 cow and calf, at 3s. 6d. per week	3	13	6
Cutting potatoes, 1d. per buſhel	0	10	0	Ditto 3 heifers in calf, at 3s. per week each	3	12	0
Setting, 2s. per acre	0	12	0	226 buſhels given to three milch-cows in 151 days, being half a buſhel per day each, at 1s. per buſhel	11	6	0
Hoeing, 2s. per acre	0	12	0				
Earthing-up, 2s. per acre	0	12	0				
Taking up and ſecuring, 1s. per acre	6	0	0				
Rent and Taxes, 6s. per acre	1	16	0	280 buſhels reſerved for ſeed	14	0	0
£.	31	14	0	£.	79	16	6

I, THE above-named William Seaton, do hereby certify and declare, that the facts above ſtated are, to the beſt of my knowledge and belief, juſt and true; as witneſs my hand, this 8th day of November, 1798.

WILLIAM SEATON.

I, JAMES BUNN, of Staplefield Place, in the county of Suſſex, do certify, that I am well acquainted with the above William Seaton, that he is a man of veracity, and that I verily believe the account above ſtated by him to be true; as witneſs my hand, this 8th day of November, 1798.

JAMES BUNN.

I, WILLIAM LAMBE, of the Middle-Temple, London, Eſq. do hereby certify, that the above-named William Seaton is tenant to me of the land above-mentioned; that the facts above ſtated were by him reduced into writing in my preſence,

ſence, and upon the ſpot; and that, upon inſpection and enquiry, I verily believe the ſame to be true; as witneſs my hand, this 10th day of November, 1798.

WILLIAM LAMBE.

No. 4, Pump-Court, Temple.

Mr. MORE.

The GOLD MEDAL, or the SILVER MEDAL and TWENTY GUINEAS, at the option of the Candidate, being the firſt Premium offered for IMPROVING LAND LYING WASTE OR UNCULTIVATED, was this Seſſion adjudged to Mr. ROBERT BELL, of Huntſhill, near Jedburgh, North Britain; but Mr. Bell dying before the diſtribution of the Rewards, his Son and Heir, made choice of the SILVER MEDAL and TWENTY GUINEAS.

SIR,

I ADDRESS this letter from the borders of Scotland, where ancient contention in the rivalry of arms has given place to a ſpirit of emulation in the arts of peace. The animoſity of our anceſtors, which ſo frequently wrapped this part of our happy Iſle in the flames and deſtruction of war, has ſubſided: induſtry, mutual eſteem, and reciprocal good offices, have ſucceeded; and the ſheep crook and fertilizing plough

are

are the only implements which occupy the hands and attention of our proſperous community. Thoſe improvements in the Arts which were firſt introduced into the Siſter-Kingdom are ſucceſsfully practiſed here; and ſuch in particular as are connected with the rural economy have been already carried to a great degree of perfection. Their further progreſs is alſo encouraged by praiſeworthy, patriotic inſtitutions; though by none of ſuch great and extenſive utility as that of the Society for the encouragement of Arts, Manufactures, and Commerce.

Having ſome months ago ſeen the liſt of premiums offered by this laudable Inſtitution, my attention was naturally directed to that claſs of them intended for the encouragement of agriculture. I had farmed to a conſiderable extent for more than thirty years; and having acquired experience in the cultivation of land, it was impoſſible I ſhould overlook a plan which ſeemed ſo eminently calculated to promote the improvement of this uſeful art. My attention once

once excited, I reſolved to contribute my mite in furtherance of the patriotic views of the Society, by giving an account of the improvement of an extenſive farm, containing a large portion of land lying waſte and uncultivated, in which I have been engaged for theſe eight years paſt.

Previous to commencing this intended labour, however, in compliance with the direction contained in the publiſhed notice, I procured and carefully read over the laſt Volume of the Society's Tranſactions. The peruſal of this work could not fail to inſpire me with a juſt reſpect and eſteem for ſo honourable and uſeful a Society. I have paid every attention to the ſpirit of the premium offered for the improvement of waſte land; I truſt that I have not ſo far miſunderſtood it, as to be liable to be accuſed in the paper which accompanies this letter, of too great a degree of conciſeneſs on the one hand, or of unneceſſary prolixity on the other. The lateneſs of the arrival of this Volume greatly retarded the commencement

mencement of the account of my improvements; ſo that I have much to regret on account of the ſhortneſs of the period which I have had for its relation.

In giving an account of the mode I employed in the improvement of waſte and unproductive ſoils, I have ſtudied the utmoſt plainneſs and preciſion. I ſhall leave it to ſpeak for itſelf, when I have previouſly informed the Society that the want of minute accuracy, obſervable in different parts of the paper, is to be attributed to the circumſtance of my having no intention of publiſhing an account of my improvements, until the period when I firſt noticed their premium. While I mention this, however, I muſt be permitted to declare that I have ſtudied accuracy on every eſſential point of the ſubject; and that, in the accounts of money expended on the improvements, I have as ſtudiouſly avoided error: if I have fallen into any in this part of the account, it is in the moderation of the ſtatement of the charges.

The

The paper is accompanied by a certificate from a Gentleman of eminence in literature; and if farther atteſtation were neceſſary, my improvements are of ſo prominent a nature as to procure it from numerous reſpectable characters. I humbly therefore offer myſelf a candidate for the approbation of the Society. If I ſhall be honoured with ſucceſs, and if the account of my improvements cauſes the melioration of any of the many thouſand acres of waſte land throughout the iſland, I ſhall have obtained the utmoſt object of my ambition.

With warmeſt wiſhes for the ſucceſs of the patriotic views of the Society,

I am, SIR,

Your moſt humble Servant,

ROBERT BELL.

Huntshill, near Jedburg, North Britain.
Dec. 3, 1798.

Mr. MORE.

An

An Account of the Improvements upon an extenſive Farm, containing a large portion of Land lying waſte and uncultivated.

IN the year 1790 I took a leaſe of an eſtate of about eleven hundred acres, ſituated to the north of the weſtern extremity of the Cheviot hills. It had been recently purchaſed by a Gentleman of great profeſſional eminence, who was well acquainted with the great and laſting advantages that flow from judicious improvement: it is not to be wondered at therefore, that the learned proprietor was not contented with allowing his lands to remain in a ſtate of comparative barrenneſs, under a ſyſtem of agriculture which had hardly emerged from a ſtate of ancient ignorance; he reſolved that plenty ſhould occupy the place of long-exiſting ſterility, and let his eſtate to me upon an improving leaſe.

At the period when this leaſe was taken, the eſtate was divided into four farms: the leaſe of the principal farmer was bought

bought up by the landlord, and I entered into the poſſeſſion of this part of the grounds at the period already mentioned. Two ſmaller farms came into my hands, the one of them one year, and the other four years afterward. The leaſe of the remaining farm expired at Whitſunday 1798; but by the bankruptcy of the farmer, it has been in my occupation ſince the ſame term of 1794.

Such being the ſtate of the leaſes on the eſtate, my rent was of a progreſſive nature. When I entered into the poſſeſſion of the firſt farm, I paid £.270; and at the expiration of the leaſe of the ſecond ſmall farm, my rent was advanced to £.297. It was at this period that I entered on the farm, the occupier of which had become inſolvent: I continued to pay his rent until Whitſunday 1798, the time at which it would have regularly fallen into my poſſeſſion. At this term my rent roſe to £.550, at which ſum it continues ſtationary until the expiration of the firſt twenty-one years, when it

it rises to £.700 for the remaining period of the lease.

This progressive mode of affixing the rent was considered equally advantageous to both landlord and farmer: the former was benefited by getting an increased rent upon the lands which were first occupied, by the augmentation of his rental, in a short period, from £.312 to £.550, and in receiving, besides the great emoluments arising from plantations, a return of seven per cent. during the last years of the lease. The advantage to the occupier of the lands arose from the circumstance, that as his improvements extended, the soils were more able to afford an additional rent.

The estate was in so wretched a situation, that this increase of rent could not be produced but at the expence of great sums laid out upon the improvement of the land. That I might be indemnified therefore for this necessary expenditure, the term of the lease was made forty years; and at the expiration of twenty-one, the option of two lives

was

was in the choice of the farmer. The landlord, ſtill further to encourage the improvement of his eſtate, bound himſelf to advance £.800, in ſums of £.200, every ſix months, to the farmer, to be expended upon the lands; and to give about an equal ſum for the erection of a good farm-houſe and farm buildings. The farmer was alſo allowed a power to ſub-let the grounds for any period, not exceeding that of his tenure of the eſtate.

In conſideration of theſe advantages, I bound myſelf to manure the whole lands, and to bring them into a ſtate fit for producing corn; except a portion of them, which was in a moſſy, boggy condition. The draining of this moſs was, however, enjoined, as well as the incloſing of the eſtate. I likewiſe obliged myſelf to add about £.300 in carriage and other labour to the ſum given for the buildings, and to pay five per cent. for £.400 of this money advanced by the landlord.

Theſe are the principal features of my leaſe, which I have thought it neceſſary to particularize

particularize in this place; they beſpeak the moſt liberal views in the enlightened proprietor, and are deſerving attention from their being eminently calculated to excite the exertions of ſkill and induſtry in the improvement of waſte and unproductive ſoils.

In commencing the improvement of my farm, the firſt object that demanded attention was to ſhelter the lands in ſo high and expoſed a ſituation. The ſurface of the eſtate is a riſing ground, ſloping chiefly to the ſouth, and in a leſs degree to the north: the greateſt and beſt part of the land is contained in the ſouthern ſlope, at the bottom of which is the moſs, formerly noticed. It is ſheltered on the ſouth by an oppoſite higher ground; ſo that, as the eſtate is of a pretty regular ſquare form, there were only three ſides upon which ſhelter was required.

A ſmall ſpace upon the eaſtern extremity of the eſtate, where it was not thought proper to plant, was fenced with a double ditch and hedge; but around all the remaining expoſed border, a plantation of Scotch firs,

firs, about a hundred feet in breadth, was made. This plantation was incloſed with turf dikes, calculated to protect the plants for many years; and a ſimilar plantation, extending from one extremity of the eſtate to the other, was carried along the brow of the hill in a waving line, to ſhelter the grounds on each ſide below. The plants are making rapid progreſs towards maturity, and will amply reward the proprietor for his expences of planting.

Theſe plantations were calculated to afford a general ſhelter; but over a wide range of ſurface more immediate protection was neceſſary. Incloſing is every where highly advantageous and proper, and I cheerfully fulfilled my obligation of ſubdividing the lands: the mode of incloſing which, of all others, recommended itſelf for adoption, was that of ditch and hedge.

There were no incloſures upon the grounds, except a few bad hedges in the neighbourhood of the manſion-houſe, which is ſituated upon the north ſide of the

the eſtate: the incloſures upon this part of it were completed, and ten ſquare fields, containing about an hundred acres of land, were formed. I expended a ſmall ſum of money in manuring a part of theſe incloſures, and ſub-let them, upon a ſhort leaſe, to a Gentleman who, though previouſly unacquainted with agricultural purſuits, has nevertheleſs ſucceſsfully improved his farm after the example ſet him in the improvement of the other parts of the eſtate.

The lands upon the ſouth ſide of the plantation running along the high ground, were all ſubdivided into regular incloſures in the courſe of the winters 1790 and 1794: the fields vary in ſize according to the nature of the ſurface, but the general quantity of ground they contain is about twenty acres. The hedges are all run in ſtrait lines, and all the incloſures are regular ſquares, except thoſe which are bounded by the plantations, by the double ditch and hedge on the eaſt border of the eſtate, or by the moſs at the bottom of the hill. The

thorns have advanced rapidly in their growth, and many of the hedges are already perfect fences.

This rapidity of growth is to be aſcribed to the great attention which was paid to the pulverization of the ſoil for a conſiderable depth; and to the manuring it with lime and rich ſtable-yard dung, previous to the planting of the thorns. This effect has alſo ariſen from the after-care which has been beſtowed upon the plants in keeping them free from weeds, properly pruned, and their roots always covered with earth: for theſe purpoſes a hedger is kept upon the eſtate, at the mutual expence of the landlord and farmer; and when he requires aſſiſtance, I pay labourers to work under his direction.

Beſides this care of the plants, however, much attention alſo is paid to the protection of the hedges from the injuries they are liable to ſuſtain from the ſheep grazed in the fields. The ditch affords a ſufficient barrier on one ſide; but on the expoſed ſide of

of the hedge there is a neceſſity of running a paling of three bars at the diſtance of a foot from the thorns: the wood for this paling is given by the proprietor from a plantation of Scotch firs upon the eſtate; it is erected at my expence, and there is ſometimes a neceſſity of renewing it before the thorns have arrived at ſuch a degree of ſtrength as to be no longer obnoxious to injury.

It is worthy of notice that thoſe thorns which were planted the earlieſt in the ſeaſon have every where thriven the beſt.

I ſhall not unneceſſarily add to the length of this paper, by deſcribing the particular mode of conſtructing my ditch and hedge; I ſhall only ſtate that I have made five thouſand ſix hundred and forty-three roods (each rood containing ſix yards) of this kind of fence; and that this quantity of incloſing, together with the expence of protecting the hedges, has coſt me the ſum of five hundred and ſixty-four pounds.

Having given this account of the incloſing of the principal part of the eſtate, we are prepared to enter upon the diſcuſſion of the next ſubject which claims attention previous to the account of the improvements; viz. the ſtate of the lands and mode of occupation at the time when I entered into poſſeſſion.

Within the laſt fifty years the agriculture of Scotland has undergone rapid and extenſive improvement: the antiquated and unproductive ſyſtem of our forefathers has given place to the principles of agriculture which have flouriſhed and been perfected in many parts of the ſiſter kingdom; and in this particular county there are few diſtricts over which improvement has not extended its beneficial influence. In the number of theſe diſtricts however, was ſituated the eſtate, the improvements upon which make the ſubject of this communication to the honorable Society for the Encouragement of Arts, Manufactures, and Commerce: here Prejudice had fixed his dominion; and

after

after the ancient mode of huſbandry, the ſoils were divided into what was termed *in-field* and *out-field* land, and into moor land, meadow, and bog.

The *in-field* land was that part of the eſtate which conſiſted of the richeſt ſoil, and in the preſent inſtance amounted to about three hundred and thirty acres. It was conſidered worth a rent of ten ſhillings an acre, and was managed in the following manner. The land was ſummer-fallowed, cleaned of weeds, and ſown with barley or oats, and ſometimes with wheat. The farmers produced, however, very ſmall quantities of the laſt grain; and their eſtabliſhed mode of managing this kind of ſoil was to take four or five crops after fallow, and then to repeat the ſame unproductive ſyſtem of fallowing and hard cropping: they raiſed very ſmall quantities of turnep, and theſe too only during the laſt years of their occupation of the grounds.

The *out-field* land was of a poorer quality; a part of it was valued at five ſhil-

lings, but the greater proportion of it was only rated at three ſhillings per acre. The quantity of this ſoil was about three hundred and twenty-five acres; more than two parts of it were always in a ſtate of natural graſs, and the remainder was cropped with oats.

In order to bring this land into a ſtate fit for producing corn, they folded a portion of it with ſheep, and ploughed it up in the proper ſeaſon for oats. They renewed this crop for four or five years, until the land was ſo over-run with couch-graſs and other noxious weeds, which poſſeſs a barren worn-out ſoil, that it was incapable of producing even the moſt ſcanty returns; it was therefore allowed to remain in this waſte impoveriſhed ſtate, until it was again folded in rotation: the vegetation of the weed graſs and other weeds produced a barren herbage, and the land was paſtured with ſheep.

The ſheep were grazed in common, upon this out-field land, and upon the moor land,

land, which compoſed conſiderably more than a third part of a eſtate: about a hundred acres of this ſoil were woodland; and that part of which was in the occupation of the farmers, and amounted to more than three hundred acres, was not eſtimated at a greater rent than one ſhilling per acre. It required one acre of the out-field, and four of the latter deſcription of land, to maintain one ſheep throughout the year, and that too in the pooreſt condition. The ſheep were always ſmall, and never could be fed fat upon the paſture; the lambs produced from the ewes were equally bad, and at an average were never ſold at above five ſhillings per head.

The produce throughout their farms may readily be conceived to have been of the pooreſt nature, when it is known that ſeveral of the farmers were unable to pay the ſmall rents they held them at, became inſolvent, and were obliged to give up their leaſes to the landlord. It is indeed a ſubject of wonder how they were able to diſcharge the moſt

moderate rents; for, with the additional information that the meadow and moſs land was adequate to the maintenance of a few black cattle only, the above relation is a faithful picture of the wretched means they employed to draw them from the lands. By this mode of occupation it muſt appear how great a proportion of their farms lay in an impoveriſhed waſte ſtate at the time when I rented the eſtate: the beſt ſoils produced very poor crops, and the degree of fertility of the out-field land has been already noticed. A great proportion of this kind of ſoil was lying waſte in a ſtate of natural graſs; and there was likewiſe a conſiderable quantity of it which had never been ſubjected to the operation of the plough. Upon this portion of land, furze, broom, heath, and ling, were the common productions: the moor, meadow, and moſs land, were in a ſtate of nature; nothing had been attempted to meliorate them.

In ſuch a ſituation, where ſo much was to be done, and where every ſpot of land

was

was unproductive or waſte, general improvement was an arduous undertaking: I had, however a clear perception of the advantages that would reſult from my plan of improvements, and reſolved to execute them with the neceſſary ſpirit and perſeverance. How far this plan has ſucceeded will be afterwards ſeen; but before we direct our attention to the account of the improvements, it is proper that I ſhould ſtate the nature of the ſoils which have been the ſubject of melioration, and premiſe a few obſervations upon the labour requiſite to the carrying on my operations.

The ſoils throughout the eſtate differ greatly in quality, though very little in kind, except in the moor and moſs land: they vary from a dark, heavy, loamy clay, to a light ſoil of the ſame nature: the ſubſtratum is a free ſtone rock; the ſoil of the moor land is a few inches of black mooriſh earth, upon a ſtratum of clay; that of the moſs is a deep peat earth. This difference of ſoils did not prevent me from adhering to

a regular

a regular plan of incloſure, as I was convinced that improvement would render each ſoil capable of the ſame mode of culture, and hence that variations of ſoil included in the ſame field would not be productive of inconvenience.

Labour is a part of the expence in the improvement of waſte or unproductive ſoils, which in every ſituation muſt prove conſiderable: the land is incapable of maintaining the quantity of ſtock that is neceſſary: foreign aſſiſtance is required; and the improvements are executed at great additional expence.

In carrying on the improvement of my farm, I was much aſſiſted by labour, ſupplied from two other farms, which I poſſeſſed at ſome miles diſtance. By means of theſe I was always enabled to keep ſix draughts upon the improving farm, and frequently ten during the ſummer. The ploughs and carts are drawn by two horſes only, and the ploughmen rank among the moſt expert in the kingdom: the plough

which

which is in common uſe, throughout all the improved diſtricts of Scotland, is Small's chain-plough; an engraving of which is given in different agricultural publications. I uſe it without the chain, and can give my teſtimony in favour of the general utility of this eſteemed plough.

The manual labour always required a number of labourers, beſides thoſe employed in ploughing, carting, aud harrowing: in eſtimating the expence of the latter operations, I have made full allowance for the advantageous circumſtances under which they were executed.

When I entered upon the improvement of my farm, it was my object to complete it in thoſe fields which contained the greateſt proportion of good ſoil. The grounds which were under cultivation were improved at leſs expence of labour than the uncultivated lands; but the only difference in the improvement of the various ſoils, aroſe from the length of time neceſſary to the pulverization of the waſte and moor land.

land. My intention, in every ſituation, was to bring the ſoils into a ſtate of fine tilth, and thus render them fit for the reception of manure, and a crop of turnep.

The ſurface of the lands which had been under cultivation, prevented many great irregularities, wet marſhy places, and numerous land-ſtones collected in ſeveral parts into heaps. Many of theſe land ſtones were of great ſize, and could not be carried off the grounds: for theſe, ſtone pits ſufficiently deep to admit of their being covered with fourteen or fifteen inches of mould, were dug; and, as a proper precaution, the pits, when there was a declivity, were ſunk at the upper ſide of the ſtone. When theſe ſtones had thus been removed, and when the wet parts had been ſucceſsfully drained with covered drains, the cultivated grounds were ploughed in the beginning of winter; and by the repetition of this operation, with the aſſiſtance of the ſpade, every hurtful inequality of the ſurface was levelled.

The

The quantity of labour requiſite to the the pulverization of the ſoil varied according to the nature of the ground: that portion of the cultivated ſoils which was managed as in-field land, required three ploughings; but the part of them which came under the denomination of out-field, demanded the quantity of labour which was beſtowed upon the ſame deſcription of land, lying waſte in graſs, after it had been cropped with oats.

Upon the improvement of this part of my farm I ſhall not be more particular, as the other parts of the proceſs will be comprehended under the account of that of the waſte land. I have, however, placed amongſt the tables of expenditure, one to ſhew the expence attendant upon the melioration of the beſt ſoils.

The improvement of the proper ſubject of this paper, the waſte and moor land, comes now under review; and that I may avoid confuſion in the account of this proceſs, I ſhall divide the grounds into two kinds;

kinds; viz. into that portion of out-field land which was exhauſted and lying in a ſtate of natural graſs; and into that which had never been ſubjected to the operation of the plough, and was over-run with furze, broom, heath, and ling. In detailing the improvement of the laſt ſpecies of waſte land, I ſhall comprehend under the ſame head that of the wet marſhy ground and moor land.

In effecting the melioration of the firſt deſcription of waſte land, the preliminary ſteps of land-draining the wet places, and of removing the land-ſtones which obſtructed the progreſs of the plough, were executed.* The laſt operation was peculiarly neceſſary; for beſides the numerous land-ſtones diffuſed over the general ſurface of the grounds, there were great collections of them upon balks, which had been formed by the ſlovenly huſbandry of ancient farmers

* I have this ſeaſon completed the improvement of a field which contained an aſtoniſhing quantity of land-ſtones. In this incloſure there are the remains of what

farmers on the eſtate: theſe balks occured over all the lands which were or had been under cultivation.

On the removal of every material obſtruction, the land was ploughed with a common furrow in the month of November; and about the end of the following ſpring it was ſown thick with oats. The produce of this crop was always of the pooreſt nature, and did not make a return of three times the quantity of the ſeed: it however indemnified me for the labour which had been beſtowed upon the ground; and the cropping anſwered the purpoſe for which it had been employed.

When I commenced the improvement of this deſcription of land, I fallowed and wrought it for two years: I ſoon, however, found the error of this practice, and the great expence

is believed to have been a Daniſh encampment; and, upon an adjoining property, there are two out-poſts at a ſmall diſtance. I have completed the filling up of the outer ditch, which time had not perfected, and the peaceful ploughſhare now paſſes over that ſpot where erſt embattled hoſts poured forth terror and deſtruction.

expence of labour attendant upon the adoption of it. The ſoil was choaked with couch-graſs and other noxious roots; and upon lying for even a few weeks, eſpecially in wet weather, the land became nearly as much filled with graſs as when the ſward was firſt broken up. To remedy this inconvenience, I firſt thought of ſowing the ground thick with oats: the effect has anſwered my expectation, for by the growth of the oats the couch graſs is prevented in a great meaſure from ſpringing up, the ſoil is looſened, and much leſs labour is requiſite to its pulverization.

The oats having been removed, the land was again ploughed in the end of autumn, and expoſed to the action of the weather and temperature of the winter ſeaſon in the ſtate of a rough furrow: it was croſs-ploughed in the beginning of April, and afterwards braked* and harrowed. About the

* This operation is performed by an implement reſembling in every reſpect a harrow, except that it is larger, heavier, and has longer tines.

end of the ſame month it was again ploughed, braked, and harrowed; and in May the ploughing and harrowing were repeated. In the courſe of this labour it was ſometimes neceſſary to paſs a heavy roller over the land, in order to break down the firmer clods.

Upon the completion of the laſt harrowings the roots of the couch-graſs were carefully collected and burnt: the land-ſtones were removed off the grounds as they were turned up by the plough; and by means of this implement and the ſpade, every hurtful inequality of the ſurface was deſtroyed.

When this labour had been beſtowed, the ſoil was brought into a ſtate of ſufficient fineneſs for the application of manure. Before I proceed to give an account of this part of the ſubject, however, I ſhall previouſly detail the mode of tillage I employed to bring the ſecond deſcription of waſte land into a ſimilar ſituation.

The furze and broom having been removed off the ground, the draining of the

wet places completed, and the larger land-ſtones carried off, the land was ploughed in November.* The furrow was made about four inches in depth, and allowed to remain in the coarſe ſtate in which it had been formed by the plough throughout the winter: the land was croſs-ploughed in May following, and afterwards braked and harrowed. It was again ploughed, braked, and harrowed, in July or Auguſt; and after the completion of the laſt part of the labour, it was ploughed into ridges of nine or twelve feet in breadth. The furrows were well cleaned out by the plough, to prevent the rain water from ſtagnating upon the lands; and they were again expoſed to the influence of the winter's froſt.

The furrows were filled up by the plough about the end of the ſucceeding ſpring, and the land was again croſs-ploughed and harrowed. After this harrowing, the roots of

of

* The broom was ſold for fuel: the price received for it, defrayed the expence of its removal, as well as that of the furze.

of the ling, and other coarſe graſſes which had not periſhed during the eighteen months the land had lain in fallow, were collected into ſmall heaps and burnt into aſhes. Upon this incineration the land was for the laſt time ploughed and harrowed; and thoſe roots which had eſcaped obſervation were deſtroyed by a ſecond burning.

In the courſe of the labour beſtowed upon the grounds, the land-ſtones were carted off the field as they were brought under obſervation, and every injurious inequality of the ſurface was levelled. The land was therefore, by this proceſs of culture, freed from every foreign hurtful ſubſtance, and the ſoil was perfectly pulveriſed and rendered fit for its combination with manure.

When I had brought the lands into this ſtate of fine tilth, another more expenſive part of the proceſs of improvement followed; viz. the manuring of ſoils, waſted and exhauſted of animal and vegetable matter.

The manure which forcibly recommended itſelf in ſuch a ſituation, was lime: dung, though in a leſs degree, was alſo neceſſary and eſſential to the melioration of ſoils lying in ſuch a condition. I was ſituated at a great diſtance from the former kind of manure, but nevertheleſs reſolved to uſe it in a quantity adequate to the purpoſe for which it was employed; convinced that too ſtrict an economy in this inſtance would be productive of certain loſs: I had it in my power to command a ſufficient quantity of dung, and raiſed in the manner afterwards deſcribed.

In the application of theſe manures the quantity was regulated by an attention to the nature of the ſoils; as theſe varied from a degree of richneſs to poverty, the lime and dung were applied in quantities adequate to their melioration. The extent of their application will be detailed in the tables of expenditure.

The lime was laid upon the lands about the end of May, and immediately after its

application

application they were ridged into drills of twenty-ſix inches for turnep: the dung was now laid on, and being ploughed down, the turnep ſeed was ſown upon the hot furrow.

Such is the method I have practiſed in improving my farm: its excellence and ſucceſs will beſt be ſhewn by introducing in this place, an account of the produce ariſing from the increaſed fertility of the ſoils.

The turneps have always proved an excellent crop, even upon the moſt clayey ſoils: they are eaten upon the ground by ſheep, properly folded with nets; except a ſmall proportion of them, which is given to black cattle. A very ſmall quantity of them, however, has been uſed in this manner, as the firſt method of conſuming them is highly advantageous to every kind of ſoil, more particularly to lands recently improved. The profit upon the crop has varied with the ſtate of the market for fat ſtock; but in general its abſolute value has not been leſs than £.3: 10s. per acre.

When the turneps are eaten off, the lands are ploughed in the proper ſeaſon for a crop of barley; and as it is my principal object in the improvement of my farm to lay the grounds down to paſture as ſpeedily as poſſible, I ſow along with the barley the following quantities of graſs ſeeds: of broad clover, twelve pounds; white clover, four pounds; rib graſs, two pounds; and of the beſt rye graſs, one buſhel.

The crops of barley have proved equally good as that of the turnep; and in general, each acre has produced about five quarters of grain.

The graſs ſeeds have always anſwered my moſt ſanguine expectations: the crop is never cut for hay, excepting only a ſmall quantity of it, which is required for a part of the ſtock upon the farm. It is paſtured by ewes and lambs; and to ſhew the value of the graſs, I ſhall give an account of the manner in which it is grazed.

In September or October I purchaſe about five hundred ewes, of the Cheviot breed, which

which are ſold by the ſtock farmer under the denomination of draught ewes. Theſe ewes are croſſed about the middle of the latter month with tups of the Diſhly breed, and are paſtured through the winter upon the moor and waſte land, yet unimproved, and upon a ſimilar paſture of one of the farms already mentioned. They begin to drop lamb about the firſt of April, and are then put into the graſs fields: theſe are never grazed after the firſt of January, ſo that when the ewes are put upon the graſs it is always a luxuriant paſture: it feeds upon an average four ewes and lambs per acre.

The lambs are ſold fat in the months of June or July, and in general bring 12s. 6d. per head. The ewes are continued on the paſture until the end of October, when they are either ſold for an increaſed price of five ſhillings each, or, as is more generally my practice, put upon turnep to be completely fattened. Upon the removal of the ewes, the graſs is eaten by young black cattle, and other ſtock upon the farm,

until the end of December. They are generally benefited by this paſture; and the advantage it is of to them, fully compenſates for the maintenance of the ewes throughout the winter. It appears therefore, from this ſtatement, that £.3: 10s. is the profit upon each acre of graſs.

The mode of paſturing is followed on the ſucceeding year: but having found that new graſs is greatly preferable for feeding lambs, I plough up the graſs fields in the third year, and ſow them with oats; which generally have been of ſuch a quality as to produce ſix quarters per acre.

The oats are followed by a crop of wheat, if dung is plentiful, but more frequently by another crop of oats or one of peas. This pulſe and the wheat have, upon an average, been produced in the quantity of twenty-nine buſhels per acre; and in a field which was laſt year ſown with this grain, and which contained ſeveral acres of moor land, the crop was moſt luxuriant upon this formerly barren heath.

This

This plan of cropping is varied according to circumſtances; but my fixed mode of management is to take alternately a green and a white crop; and never, after breaking up the graſs, to ſow more than two crops before the land is again prepared for turnep. When the turneps are ſown, the land is again manured with the original quantity of dung, and is again laid down to paſture with a barley crop.

It appears therefore that every attention is paid to avoid heavy cropping; and it is not leſs evident that, by the proſecution of this plan of management, large additions of animal and vegetable matter will daily increaſe the richneſs and fertility of the ſoils.

Having now detailed the mode of improving the arable lands, and given an account of the produce ariſing from the melioration of the ſoils, I ſhall, before I ſtate the expence of the improvement, conciſely relate the ſteps which have been taken for increaſing the value of the moſs land.

When

When I took the leaſe of my farm, this part of it was in the ſtate of a wet and unproductive bog. It was only adequate to the ſupport of a few crops and young neat beaſts; and a great part of it was ſo perfectly boggy, that it was incapable of ſupporting the cattle, which grazed upon the firmer parts of it and upon an adjoining meadow.

The firſt ſtep in the improvement of ſuch land, was to carry off the ſuperabundant moiſture by draining. I had formerly recovered about thirty acres of land upon another of my farms, which was an entire marſh; and I did not deſpair of the ſucceſs of a ſimilar mode of improvement in the preſent inſtance. In attempting the melioration of the moſs land therefore, my firſt object was to run a principal drain, ſtretching from the inferior to the ſuperior part of it, where it is widely extended upon an adjoining eſtate; and to interſect it by ſmaller drains, terminating in the main conductor of the water. I accordingly had this drain completed in the ſecond year of my occu-

pation

pation of the eſtate: it was made ſix feet deep, twelve feet wide at the top, and eight at the bottom; and ſince its formation it had been repeatedly cleaned out. The interſecting drains have not been executed, and I do not apprehend that it will be neceſſary to fulfil this part of my intention.

The ſucceſs of the principal drain has anſwered my expectations; there has been always an abundant flow of water. The moſs is in various parts converted into meadow, and there is hardly any part of it except where pits have been dug for peat, that is not pretty firm and productive of ſupport to the cattle grazed on it. The adjoining meadow is likewiſe greatly meliorated; the graſſes are much finer; and many parts of it are fit for producing corn.

The advantages attendant upon the fulfilment of a part of the plan of draining, are of the moſt promiſing nature. How far the completion of it would inſure the ſpeedy exſiccation

exſiccation of the moſs, I cannot pretend to determine. This object however ſeems more likely to be effected by another mode of draining, recently publiſhed to the world: I need hardly ſay, I mean that practiſed by Mr. Elkinton.

I have lately ſeen Mr. Johnſton's perſpicuous account of this mode of draining, and have reſolved to practiſe it in preference to my original plan. I propoſe to bore auger holes in the bottom of the principal drain immediately; and thus allow a free exit to the waters which circulate below the level of its bottom. From the nature and ſituation of the ſtrata obſerved in an unfruitful ſearch after marl, I have no heſitation in pronouncing the ſucceſs of this intended operation: I have ſtill leſs in expreſſing my hopes of converting this hitherto uſeleſs part of the eſtate into a valuable paſture-ground.

The moſs, beſides a conſiderable quantity of meadow hay, already produces ſufficient ſupport for ten cows, and twenty young

young black cattle. Theſe cattle are grazed upon the moſs through the day; and are fed with ſtraw in a court-yard during the night. The yard is always well littered with ſtraw; and as this is converted into dung, new layers of freſh ſtraw are added, until ſuch a quantity of excellent dung is formed, as is adequate to the manuring of ſixty or ſeventy acres of turnep.

Such are the improvements I made upon my farm. The expence at which they have been executed will be ſhewn by the following tables of expenditure.

I.

Average Expence of improving the beſt Soils, denominated In-field, per acre.

	£.	s.	d.
Firſt ploughing	0	5	0
Second ditto	0	5	0
Braking and harrowing	0	3	0
Third ploughing	0	5	0
Second harrowing	0	2	0
Carried over	1	0	0

	£.	s.	d.
Brought over	1	0	0
Collecting and burning the couch graſs and other weeds - - - -	0	3	0
Collecting and removing the land ſtones* -	0	7	0
One hundred and ſixteen buſhels of lime	4	7	0
Twenty cart-loads of dung, weighing 3 cwt.	2	0	0
Firſt drilling for turnep - - -	0	2	6
Second ditto - - - -	0	2	6
	£.8	2	0

II.

Average Expence of improving that deſcription of Land termed Out-field, the greater proportion of which was lying waſte in a ſtate of natural graſs, per acre.

	£.	s.	d.
Firſt ploughing - - - - -	0	6	0
Second ditto - - - - -	0	5	0
Carried over	0	11	0

* In this eſtimation of the expence of the labour beſtowed upon the land, is comprehended that of the manual aſſiſtance ſometimes requiſite to the levelling of the ſurface; and the breaking of the clods by rolling. Neither of theſe operations could be made diſtinct heads of charge. The firſt was very partially required; and the rolling was only neceſſary in the moſt clayey ſoils, and there only after a wet ſeaſon. It was very ſeldom needed by the ſoils comprehended under the ſecond table; and thoſe referred to in the third, never demanded its aſſiſtance to their perfect pulverization.

	£.	s.	d.
Brought over	0	11	0
Braking and harrowing - - -	0	3	0
Third ploughing - - - - -	0	5	0
Braking and harrowing - - - -	0	2	0
Fourth ploughing - - - - -	0	5	0
Third harrowing - - - - -	0	2	0
Collecting and burning the couch graſs and other weeds - - - - -	0	5	0
Collecting and removing the land ſtones -	0	14	0
One hundred and ſixteen buſhels of lime -	4	7	0
Twenty cart-loads of dung, weighing 3 cwt. -	2	0	0
Firſt drilling for turnep - - - -	0	2	6
Second ditto - - - - - -	0	2	6
	£.8	19	0

III.

Average Expence of improving the Moor Land and Waſte Out-field which had never been under cultivation, per acre.

	£.	s.	d.
Firſt ploughing - - - - -	0	7	6
Second ditto - - - - - -	0	6	0
Braking and harrowing - - - -	0	3	0
Third ploughing - - - - -	0	5	6
Braking and harrowing - - - -	0	3	0
Fourth ploughing - - - - -	0	5	0
Carried over	1	10	0

	£.	s.	d.
Brought over	1	10	0
Fifth ploughing - - - - - -	0	5	0
Third harrowing - - - - - -	0	2	0
Sixth ploughing - - - - - -	0	5	0
Fourth harrowing - - - - - -	0	2	0
Collecting and burning the roots of the ling, &c.	0	3	0
Collecting and removing the land ſtones -	1	2	0
One hundred and thirty-five buſhels of lime -	5	1	6
Twenty-five cart-loads of dung, weighing 375 cwt.	2	10	0
Firſt drilling for turnep - - - - -	0	2	6
Second ditto - - - - - - -	0	2	6
	£.11	5	6

Theſe tables ſhew, as correctly as it was poſſible to do at the time of their conſtruction, the expence attendant upon the melioration of each acre of the three deſcriptions of ſoils which have been the ſubject of improvement. In ſtating the different heads of expenditure however, it was impoſſible to affix to each acre of land a certain proportion of under-draining, as the neceſſity of this operation was not only partial, but infinitely varied in different ſituations,

tions. This part of the expence of improvement, therefore, will be noticed in the general table of expenditure.

The quantity of ſoils which are already improved, amounts to four hundred and ſixty-eight acres: the portion of land which comes under each table of expenditure is not eaſily aſcertained, as improvement has wrought a wonderful ſimilarity in the appearance of the ſurface of the grounds. I have, however, examined all the improved fields with great care and attention; and have had the different quantities of each kind of ſoil meaſured with as great a degree of preciſion as it was poſſible to command. To extreme accuracy I cannot pretend; but I am certain, if there is any error, that it is of the moſt trifling nature, and wholly underſerving of notice.

Having premiſed thus much, we are prepared to enter upon the general ſtatement of the expence of the improvements which have been executed upon my farm. In

giving this ſtatement, however, it is neceſſary to obſerve that there was no poſſibility of noticing every expence connected with the plan of improvement. In the execution of this plan various ſmall ſums were required by different objects; and where the improvements were executed on ſo conſiderable a ſcale, it may eaſily be imagined that the contingent expences muſt have been conſiderable. There is, however, but little reaſon for regretting the deficiency of this part of the general table of expenditure, as an account of contingencies, beſides adding to the amount of the ſum expended, would be productive of very little uſeful information.

General Table of Money laid out upon the Improvements already executed on my Farm.

	£.	s.	d.
Incloſing and ſubdividing the lands . .	564	0	0
Farmers proportion of the labour beſtowed upon the hedges	60	0	0
Improving 274 acres of land comprehended under the firſt table of expenditure.	2229	8	0
Carried over £.	2853	8	0

	£.	s.	d.
Brought over	2853	8	0
Improving 121 acres of land comprehended under the ſecond table of expenditure, nearly fifty acres of which were lying waſte, in a ſtate of natural graſs - -	1082	19	0
Improving 73 acres of land comprehended under the third table of expenditure, 42 acres of which were moor land	823	1	6
Manuring a part of the fields around the manſion-houſe before they were ſub-let	55	0	0
Draining the wet places diſperſed throughout the lands which have been improved	30	0	0
Draining the moſs - - - - -	110	0	0
Reparing one of the farm-houſes, and erecting and repairing cottages for the accommodation of labourers employed in carrying on the improvements - -	250	0	0
	£.5204	8	6

Such is the moderate eſtimation of the ſum I have expended in executing the improvement of waſte and unproductive land. I ſhall not indulge myſelf in any obſervations on its magnitude, convinced that ſilence is here equally proper and impreſſive.

The expenditure has indeed been to a great extent; but it is alſo true that it has been productive of the moſt lucrative returns. The ſoils which were in the impo-

veriſhed condition formerly deſcribed, are greatly enriched: various parts of my farm are worth fifty ſhillings an acre; and all the improved lands, upon an average, would be cheaply rented at thirty ſhillings per acre. I indeed ſub-let a field of twenty-five acres to a ſmall farmer, a twelvemonth ago, for forty-five ſhillings an acre, which before its improvement was not, upon an average, worth more than ſeven ſhillings: he pays his rent by labour in carrying lime to the parts of the eſtate yet unimproved.

The improvements have been too encouraging in their effects to leave any heſitation about the propriety of completing them; I go on to fulfil the obligations of my leaſe. All the incloſures on the ſouth of the plantation, ſtretching along the high ground, are improved, except three; and theſe I propoſe to plough up immediately: they conſiſt of waſte and moor land, and of outfield lying waſte in a ſtate of natural graſs.

In order, likewiſe, to make the remaining part of the eſtate fit for the proceſs of improvement,

improvement, the ſubdiviſion of the grounds upon the north ſide of the plantation juſt mentioned, will be completed in the courſe of this winter. The grounds, in this part of the eſtate, are of the ſame nature as thoſe which compoſe the unimproved fields on the ſouth ſide. The improvement of all the ſoils, which have been permitted to lie in the unproductive ſtate they were in at the period of my entry into the farm, will not be completed at a leſs expence than that of the ſame deſcriptions of land referred to in the ſecond and third tables of expenditure.

It is impoſſible to fix the period when the improvement of the whole land will be completed: circumſtances may haſten or retard my operations. I calculate, however, upon an end to my expences and improvements in ſix or ſeven years: I ſhall then enjoy the fruits of much labour and exertion. The difficulties engendered by induſtry will give place to eaſe and quiet; and I ſhall have the further reward of enjoying the conſciouſneſs of having proved no unuſeful

member of ſociety, in having increaſed the fertility of a portion of the earth, in having ſupported a more numerous population, and in having augmented the value of an eſtate, in no long period of years, from three hundred and twelve to more than twelve hundred pounds per annum.

I THOMAS SOMERVILLE, Miniſter of Jedburgh, in the county of Roxburgh, do hereby certify, that I reſide near the eſtate of Hunthill: that it is conſiſtent with my knowledge, that the improvements made by Mr. Robert Bell upon the ſaid eſtate have been ſkilful, profitable, and far beyond the extent required by the Society for the Encouragement of Arts, Manufactures, and Commerce; and that the land improved correſponds to the deſcription ſpecified in Article 104 of the liſt of Premiums, inſerted in the ſixteenth Volume of their Tranſactions. But being unqualified to judge either of the expence of improvevement, or the increaſed value

of

of land, I wiſh to decline to give any opinion or atteſtation on that part of the ſubject; though I know no reaſon for calling in queſtion the veracity of Mr. Bell, who has been long known to me; as witneſs my hand, this third day of December, 1798,

THOS. SOMERVILLE.

The second Premium offered for IMPROVING LAND LYING WASTE or UNCULTIVATED, being the SILVER MEDAL and TEN GUINEAS, was this Session adjudged to Mr. JOHN FOX, of Boxhill, Surrey, from whom the following Account and Certificate were received.

SIR,

OBSERVING in the Abstract of the Premiums offered by the Society instituted at London, for the encouragement of Arts, Manufactures and Commerce, that under Class 104 a Premium is offered for improving Land lying waste or uncultivated, I have taken the liberty to inclose you the particulars and account of the expences in the cultivation and improvement of one hundred and seventy-two acres of Land which were waste and uncultivated, at a place called Boxhill in the parish of Dorking, in the county of Surry; but which, in the years 1797 and 1798, I caused

to

to be cultivated, and which is now in a proper ſtate of cultivation; and I have ſpecified the mode by which ſuch land was cultivated.

I ſhall, Sir, eſteem it a favour, if you will have the goodneſs to ſubmit the encloſed to the Society; and ſhould my exertions be deemed worthy their attention, and they are pleaſed to think me entitled to the Premium under Claſs 104, I ſhall be happy to have been in the leaſt inſtrumental in forwarding their laudable purpoſes and views. If the Society ſhould require any further particulars relating hereto, or if any further certificates are neceſſary, as to the fact of my improvements or my perſonal attendance at any time, I ſhall be obliged to you for the favour of a line, which will be duly attended to by me.

I am, Sir,

Your obedient Servant,

JOHN FOX.

Boxhill, Dorking,
Surrey, Dec. 1, 1798.

Mr. MORE.

A

A Certificate of the Improvement of Land lying waſte at Boxhill, in the Pariſh of Dorking, in the County of Surrey, lately belonging to Sir Henry Powlett, Sir John Mildmay, of Dogsmearsfield Park, Hants, Baronet, but now belonging to Henry Peters, Eſq. of Betchworth Caſtle, Surrey, and in the occupation of me John Fox, in the Year 1797, *and an account of the Expences attending ſuch Improvement.*

THE land being a large quantity, and lying in an uncultivated ſtate on a hill called Boxhill, I proceeded on my deſign, and made choice of the north part of the ſaid hill, which conſiſted, one part in red marle, in another part chalk loam, the depth of from ten to fifteen inches. Underneath lies a chalk rock, and the only vegetable produce was a ſpungy moſs bent graſs. With this were mixed ſome coarſe half-dead graſs, which all cattle refuſed, except ſheep in the winter, when every other plant was deſtroyed, and the ground became

became bare. I began the firſt operation by paring off the ſurface to the depth of about three inches, and which, as ſoon as dry, was burned in heaps at convenient diſtances, for the benefit of ſpreading the aſhes. This was done all ſummer, from February, 1797, to October following, for different crops; firſt, from February the 11th, to the firſt day of May for oats, fifty acres; from the 1ſt of May to the 15th of July, for turneps, thirty-five acres; from the 15th of July to the latter end of October, twelve acres for wheat.

The following is the eſtimate of the expences of cultivation; and the quantity of oats ſown on the firſt fifty acres was about five buſhels per acre, and produce about ſeventy buſhels per acre. The oat-aſh I ploughed, and ſowed with wheat, about three buſhels per acre, and produce about twenty-ſix buſhels per acre. The thirty-five acres ſown with turneps were worth about two pounds per acre. In the ſpring of 1798, the ſame land I ſowed with barley, about four buſhels

per

per acre; produce, about fifty bushels per acre. The twelve acres sown with wheat, 1797, from paring and burning, before any other crop, I sowed three bushels per acre; produce, about thirty bushels per acre.

The following is the estimate of the Expence and Produce of one Acre.

One acre of the fifty, sown with oats.

	£.	s.	d.		£.	s.	d.
Paring and burning, and spreading, ashes . . .	2	4	0	Value of the Crop of Oats, per acre . . .	9	18	0
Ploughing for oats	0	12	0	Straw . . .	1	4	0
Seed	0	17	6		11	2	0
Harrowing . .	0	3	0				
Mowing . . .	0	3	6	Expences . .	4	13	0
Thrashing . . .	0	13	0				
	£.4	13	0	Balance . . .	6	0	9

Wheat on the above fifty acres sown in in September 1797.

(One acre.)

	£.	s.	d.		£.	s.	d.
Ploughing . .	0	10	0	Value of the Wheat Crop per acre	7	0	0
Seed . .	1	1	0	Straw . . .	1	5	0
Harrowing . .	0	3	0		8	5	0
Reaping . . .	0	12	0				
Thrashing . .	0	10	6	Expences . .	2	16	0
	£.2	16	6	Balance .	5	8	6

	£.	s.	d.
Ploughing for barley, per acre	0	10	0
Seed	0	15	0
Harrowing	0	3	0
Mowing	0	3	6
Thraſhing	0	12	0
	£.2	3	6
Expence of Turneps	3	7	0
	£.5	10	6

	£.	s.	d.
Value of the Crop of Barley, per acre	9	0	0
Straw	1	5	0
	10	5	0
Turneps	2	0	0
	12	5	0
Expence	5	10	6
Balance	£.6	14	6

Thirty-five acres for Turneps.

Expences for one acre.

	£.	s.	d.
Paring, burning, & ſpreading aſhes	2	4	0
Ploughing	0	10	0
Harrowing	0	3	0
Turnep ſeed	0	8	0
Hoeing	0	8	0
	£.3	7	0

	£.	s.	d.
Value of the Turnep Crop, per acre	2	0	0

The following is an eſtimate of the Expences and Produce of one Acre out of the twelve Acres of Wheat ſown.

	£.	s.	d.
For paring, and burning, and ſpreading aſhes, per acre	2	4	0
Ploughing, do.	0	10	0
Seed	1	1	0
Harrowing	0	3	0
Reaping	0	12	0
Thraſhing	0	10	6
	£5	0	6

	£.	s.	d.
Value of the Crop of Wheat, per acre	9	0	0
Straw	1	5	0
	10	5	0
Expence	5	0	6
Balance	£.5	4	6

Seventy-five acres of land cultivated, and not pared and burnt, on Boxhill Farm, early in the year 1797, on the weſt part of the ſaid hill, was covered with juniper buſhes and thorns, which no breaſt plough could touch; nor was there any turf ſufficient from which any aſhes could be collected, nor graſs, but what all cattle refuſed. In fact, this ground was worth no more than the growth of the junipers and thorns; and the ſlowneſs of the growth made it of the ſmall value of one ſhilling, per acre, *per annum*.

The following is the eſtimate of the Expence and Produce of the Crop of Oats of ſeventy-five acres, which were ſtocked, grubbed, and root-picked.

Seed four buſhels per acre.

Produce, about twenty buſhels per acre.

Expence of one acre, ſtocking and cleaning	£.	s.	d.
	0	15	0
Picking and fagotting	0	8	0
Ploughing	0	10	0
Seed	0	16	0
Harrowing	0	3	0
Carried over	2	12	0

Value of the Crop of Oats per acre	£.	s.	d.
	2	5	6
Straw	0	10	6
Carried over	2	16	0

	£.	s.	d.
Brought over	2	12	0
Mowing . . .	0	2	9
Thraſhing . .	0	3	6
	2	18	3
Value of faggots	1	8	0
	1	10	3

	£.	s.	d.
Brought over	2	16	0
Expence . .	1	10	3
Balance . .	1	5	9

The following is the eſtimate of the Expence and Produce of the Crop of Turneps and Rape ſown on the ſeventy-five acres before-mentioned.

Expence per acre.

	£.	s.	d.
Ploughing . .	0	8	0
Seed	0	1	6
Harrowing . .	0	2	0
	0	11	6

	£.	s.	d.
Value of the Crop of Turneps and Rape ſeed, per acre . . .	1	2	6
Expence . . .	0	11	6
Balance . . .	0	11	0

(The whole of which were cultivated in the year 1797, and not any part of the ſaid land before ploughed or cultivated in any manner whatever.)

The above ſeventy-five acres not having turf ſufficient to pare and burn, were not

in

in a ſtate to receive a ſecond crop of corn; but there is but little doubt that from the crop of turneps and rape being fed off with ſheep, it will be in a ſtate to grow oats, and be proper to be laid down for graſs ſeed.

Acres pared and burnt	97
Acres grubbed, &c.	75
Total	172

I JOHN FOX, of Boxhill in the pariſh of Dorking, in the county of Surrey, do hereby certify to the Society inſtituted in London, for the Encouragement of Arts, Manufactures, and Commerce, that the above particulars are in every reſpect true and juſt. Given under my hand, this 30th day of November, 1798,

JOHN FOX.

WE whoſe names are hereunto ſubſcribed, the Miniſter, Churchwarden, and inhabitants of the pariſh of Dorking

Dorking aforesaid, do hereby certify, that we believe the above particulars and account of Mr. Fox's Improvements of Land, which was waste and uncultivated, at Box-hill, in the parish of Dorking, is true; as witness our hands, this 30th November, 1798.

SAMUEL GOODINGE, Minister.

EDW. ANSELL,
P. ROTHAM,
ROB. PIPER,
JOHN ATLEE,
GEO. SHEEN,
SAM. DENDY,
JOHN WILSON,
} Churchwarden and principal Inhabitants.

The following Papers were this Seſſion received in claim of the Premium offered for MAKING HAY IN WET WEATHER; but it having been communicated to the Society, that the manner of *tippling* Clover and Lucerne Hay, as deſcribed by Mr. WAKEFIELD, has been long known and practiſed in ſome of the Northern Counties, though not in uſe in the Southern parts of this Iſland, the Society voted to Mr. Wakefield their SILVER MEDAL, conſidering that the method is likely to be attended with good conſequences, if made generally known through the Kingdom.

SIR,

I HAVE ſent to the Society for the Encouragement of Arts, Manufactures, and Commerce, a truſs of Clover Hay, and a few tipples of Lucerne Hay, made or cured by a method too little practiſed, as it ſecures theſe graſſes from damage in the worſt of ſeaſons, and

and preſerves the leaves and bloſſoms perfect: when intended for ſeed, the whole is ſaved. I do not know that any experiments of this kind have yet been made on white hay. The practice is to roll the graſs up immediately after the ſcythe, into bundles or tipples, of the ſize of a ſmall barley-ſheaf; then draw out a band from one ſide (leaving it united), twiſt it as drawn out, and tie it firm round. The tipple being placed betwixt the knees, that part above the band is drawn through the hands with a twiſt, and the longeſt graſſes drawn out ſo far as to tie in a knot, which finiſhes the point of the cone, and forms the tipple. See the cut annexed.

The advantages are evident, as the rain is carried off ſimilar to the thatch of a

houſe, and the ſun and wind have ſuch acceſs as to prevent fermentation, conſequently cannot injure in any reaſonable time.

I am,

Your moſt obedient ſervant,

THOMAS WAKEFIELD.

Liverpool, 27th Dec. 1798.

Mr. MORE.

SIR,

THE truſs of Clover Hay I ſent to the Society, by Mr. Wakefield's orders, is out of one of the ſtacks on Trafford Moſs, and is not ſuperior to the whole. This year I tippled about thirty-ſix ſtatute acres, and the weather was very rainy for three weeks: laſt year I tippled upwards of eighty acres, both crops, the firſt of which was out upwards of ſix weeks, in almoſt conſtant rain, and not touched until it was houſed;

houſed; except after a violent wind I ſent a man to put up what fallen tipples might be blown down. The expence of cutting and tippling is 9s. per ſtatute acre, and the people got 2s. 6d. per day by the work.

I am

Your moſt humble ſervant,

JAMES GREENHALGH.

Trafford Moſs, Dec. 28, 1798.

Mr. MORE.

LAST winter a conſiderable quantity of Clover Hay was received at Mancheſter barracks, by the Princeſs Royal's own Regiment of Light Dragoons, under the command of Col. M'Dauale, which was of excellent quality, and was grown on Trafford Moſs. It was cured by the method of tippling, by which means the leaves and bloſſoms were perfectly preſerved. The quantity I believe was upwards of ſixty tons.

W. FARMER, B. M.

Hulme Hall, near Mancheſter,
December 29, 1798.

SIR,

I HAVE duly received your letter of the 15th inſt. in which you mention that the Committee of Agriculture requeſt me to inform them reſpecting the novelty of tippling Clover in cones ſtanding on their baſes, bound at the top by bands made of the ſame clover, &c.

About fourteen or fifteen years ago I procured a huſbandman from near Ripley, in Yorkſhire, an expert turnep-hoer, who the ſame year tippled ſome clover for me, which mode of making Clover Hay I have ever ſince practiſed. The man then informed me, it was in common practice in Cleveland, and had been ſo for many years. I think it the beſt method of making Clover Hay, and, all things conſidered, much the cheapeſt; and ſome of my neighbours have adopted the practice.

I am, SIR,

Your moſt obedient ſervant,

THOMAS ECCLESTON.

Scarisbrick, Jan. 18, 1799.

Mr. MORE.

The

The SILVER MEDAL was this Seſſion voted to JOHN MIDDLETON, Eſq. for the following Obſervations on various kinds of MANURE.

SIR,

HAVING made experiments with various kinds of Manure on a farm, of which I am the owner and occupier, ſituate at Merton, in Surrey, for the purpoſe of aſcertaining the moſt appropriate dreſſing for the ſoil, which is a tenacious loam on a ſubſtratum, approaching towards yellow clay, I am induced, by the regard I feel for the ſucceſs of Britiſh Agriculture, to requeſt that you will be ſo obliging as to lay the following obſervations on the ſeveral experiments before the Society for the Encouragement of Arts, Manufactures, and Commerce, for their conſideration. I hope and believe that they will be found not altogether unworthy their attention.

1. *Peat Aſhes*, from Newbury, Berks. Of theſe aſhes I have ſpread, in various quantities, per acre, fifteen hundred buſhels, on wheat, tares, ſeeds, and meadow land, without being able to diſcern any beneficial effect from them.

2. *Coal Aſhes*, ſpread on three or four acres of graſs land, in March, 1798, produced no viſible effect at *mowing time*, nor have I *ſince* obſerved any.

3. *Wood Aſhes*, the produce of my own fires, when ſpread on the graſs in February, or early in March, I have found to be of ſome, though little ſervice.

4. *Malt Duſt*, including the duſt from the malt-kilns, I uſed for two or three years, to an extent ſufficiently great to aſcertain that the benefits produced by the uſe of it are conſiderable. It may be applied in ſuch a quantity as to inſure *one large crop*; but on meadow land, even when hay is at five pounds a ton, it only repays the prime coſt.

The quantity which I have uſually laid on, has been in the proportion of from fifty

to

to ſixty buſhels per acre. The firſt coſt of kiln-duſt is ſix-pence, and of malt-duſt eight-pence per buſhel: including the expence of carriage, and ſpreading this dreſſing on the land, it amounts to about two guineas per acre. The extra crop returned me this ſum, but without profit.

5. *Soot.* Of this Manure I ſpread eight hundred buſhels over twenty acres of wheat in one year; but I could not, from the ſubſequent appearance of the crop, diſcover whether the increaſe in quantity was equivalent to the additional expence. However, it was evidently of ſome uſe; but to what extent, would require more than bare inſpection to aſcertain. By way of compariſon, ſome of the ridges were left without ſoot; they were at harveſt ſcarcely to be diſtinguiſhed from the reſt; but where the ſoot lay in larger quantity than ordinary, as was the caſe in the places at which the loads had been ſhot from the carts, the ſuperior vegetation was very diſtinctly marked. I have, on the whole, formed the ſame opi-

nion

nion with reſpect to this ſpecies of Manure, as I have already ſtated in regard to malt-duſt, namely, that it returns the coſt price, with very little profit.

6. *Soap-maker's Waſte.* I have tried only one load of this Manure on a few rods of ground, in four of my meadows. It has not produced the leaſt effect, although it is now three years ſince it was laid on. Soap-maker's waſte, Pot-aſh, and Barilla, are probably held in too much eſteem, as preparers of the food of plants, by philoſophical chemiſts, of whom it might be wiſhed that a little *practice* were combined with their *theoretical* ideas on the ſcience of Agriculture, that they would try their ſpecious theories by the teſt of experiment, before they publiſh them to the world.

I am further induced to conſider this kind of dreſſing for land, as of much leſs utility than is generally imagined, from having been informed by Mr. Ruſſel, jun. that his father, who is a Soap-maker of great reſpectability at Paris Garden, has uſed the waſte

waſte of his own manufactory on his farms in Eſſex and Kent (in the latter on a clay ſoil), without diſcovering that it was of any material benefit to the land; and that he has conſequently diſcontinued the uſe of it.

The experiments made by Major Valley, as reported in the Eighth Volume of Papers publiſhed by the Bath Society of Agriculture, ſeem alſo to prove that Dr. Hunter's food of plants does not anſwer *any* of the purpoſes for which it has been ſo highly extolled; but, on the contrary, that it is really *hurtful* to corn crops.

7. *Sweepings of London Streets.* I have uſed ſeveral hundred loads of this manure on graſs land, and have found it to be of conſiderable ſervice to the ſucceeding crops. I have uſually laid it in large heaps, and mixed with it a ſmall quantity of horſe dung: in this ſtate it generates a little heat, though leſs than might be wiſhed, which helps to decompoſe or rot the mixture; when thus prepared, it has been ſpread on the

the land, in the proportion of ten or twelve loads per acre.

8. *The Soil of Privies.* Within the laſt four or five years this Manure has been ſpread on my land, to the expence of about £.100; the proportion, from two to four loads per acre. The effect produced by it was *aſtoniſhing fertility*; ſo much ſo, as to induce me to be of opinion that it exceeds every other kind of Manure that can be brought into competition with it, at leaſt for the *firſt year* after it is laid on. In the ſecond, it is of ſome ſervice; but in the third year its effects very nearly or entirely ceaſe. From theſe premiſes I draw this concluſion, that, for land in good condition, the application of two loads per acre, per annum, will continue it in that ſtate for any length of time: and alſo, that land which has been much exhauſted might be reſtored by laying on four or five loads per acre; after which a repetition of two loads annually would be found ſufficient to keep it in the higheſt degree of fertility.

9. *Farm*

9. *Farm-yard Dung.* This, when it had been once turned and become about three-fourths rotten, I have uſed in the proportion of about *thirteen* or *fourteen loads* per acre, and found it much leſs effective for *one* year than *three loads* of night-ſoil. I believe that even a load and a half of ſoil would have been equal to the foregoing quantity of dung. In the *ſecond* year I could not perceive any difference between the dung and the ſoil.

In the laſt Volume of the Tranſactions of the Society, page 168, a crop of wheat, amounting to 56 buſhels per acre, is ſaid to have been raiſed by Mr. Henry Harper, of Lancaſhire; which is ſo much above the general average, that Mr. Harper was at a loſs how to account for it. I am inclined to think that the *Night-ſoil* contained in the mixture with which he dreſſed the cloſe, was the cauſe of this *wonderful effect*.

He mentions, that the quantity of Manure (conſiſting of *Night-ſoil*, Coal-aſhes, Sweepings of Streets, &c.) was eighty tons, and

and that the close contains eleven acres: the proportion per acre was therefore something more than seven tons. He does not say what part of this proportion was Night-soil, but it was probably not less than four tons; a quantity which, as I have before observed, is sufficient of itself to produce one immense crop.

In short, it appears to me that nature, following her general system of re-production, prepares this matter in the most perfect manner for the purpose of feeding vegetables, and raising them to the very highest pitch of excellence: and it is certain, that herbage growing under these circumstances is capable of fattening the *largest* cattle in less time than any other.

The importance of this kind of Manure being so evident, I am sure the Society will feel, equally with me, the most poignant regret, when they take into their consideration that ninety-nine parts in every hundred of this valuable article is constantly and most *absurdly* carried, by the sewers and drains,

drains, into the rivers, and thereby totally loſt to the purpoſes of Agriculture, for which it is ſo admirably adapted.

In Britain alone the quantity of this Manure, and of urine, which is annually thus waſted, is aſtoniſhingly great; probably not leſs than five millions of cart-loads, worth to the farmers two millions and a half, and to the community five millions of pounds ſterling per annum.

This ſubject is, I think, well entitled to the attention of the Society; and it would add much to the credit which they have already acquired by their patriotic labours, if they could deviſe the means whereby the waſte of this article might be effectually prevented.

I am, SIR,

Your very humble ſervant,

JOHN MIDDLETON.

Lambeth, 28th Nov. 1798.

Mr. MORE.

The

The GOLD MEDAL, or the SILVER MEDAL and TEN GUINEAS, at the option of the Candidate, was this Seſſion adjudged to MATTHEW FORSTER, Eſq. from whom the following Papers were received, and who made choice of the GOLD MEDAL.

SIR,

I BEG leave to offer my experiments and obſervations to the Society for Encouragement of Arts, Manufactures, and Commerce, for the premium of the comparative culture of Turneps, Claſs 90, having for many years paid much attention to Agriculture (particularly Turnep culture), and for fourteen years paſt have cultivated between thirty and forty acres annually, and tried many different methods of culture on that uſeful root. I hope the Society will excuſe any inaccuracy and provincial words made uſe of in my Papers.

I am,

I am, with the utmoſt reſpect, wiſhing proſperity to the Society's improvements of the chief of Arts,

Your humble Servant,

THE CANDIDATE.

Mr. MORE.

An Account of the Experiments made on a twenty-one acre Field of light ſandy loam, from four to ſix inches deep, on a ſandy ſubſtratum, to determine the comparative advantage of the Drill or Broad-caſt method in the cultivation of Turneps.

IN December, 1797, the field, being oat ſtubble, was ploughed with a deep furrow; in the latter part of April, 1798, it was harrowed with four harrows of different lengths of tines or teeth (from ten to ſix inches below the wood), giving the field four doubles. A week after, a light weed-harrow went over the field, and collected the weeds

into rows, which were carted off into a heap to make compoſt. In May the field was croſs-ploughed, with the ſame harrowing as above. In June the field was three times ploughed and harrowed as before, and twenty women hand-gathered the weeds, which were carted off to the compoſt heap.

The manure was carted from the fold-yards and ſtable dunghills into a pond, made on purpoſe to contain the fold-yard water, and the whole ſurface covered over with ſoil to prevent the fermentation from eſcaping, and aſſiſting in deſtroying the ſeed of weeds going out with the manure. Twenty cart-loads (each ſhort cart containing thirty-two Wincheſter buſhels) were laid upon each acre: the manure was ſpread upon the field, and we began to ſow the 21ſt of June: the ſeed was round white, with a ſmall mixture of red ſeed.

For many years paſt I have always ſown my turneps with a ſimple machine that fixes to the plough, and ſows the ſeed in the

the ſeam or hollow between the furrows; and a ſmall harrow fixed to the machine, harrows in the ſeed; and a plough without a machine to follow every plough with the machine, to make the diſtance two feet between the drills: if more diſtance is wanted between the drills, two ploughs may follow the machine plough, and make the diſtance three feet between the drills. The quantity of ſeed ſown is one pound per acre. I have obſerved from experience that thick ſowing is a protection againſt drought, and the plants will grow more in one week, than thin-ſown plants will do in two, as long as the plants have their nouriſhment from the ſeed, after which it is proper to hoe the firſt time.

From the 21ſt to the 28th of June, thirteen acres were ſown on two-foot drills. On the 28th eight acres were ſown; viz. four acres and a half drilled at eighteen inches; three acres and a half ſown broad-caſt, and rolled the ſame day, which I always practiſe on dry land, as it keeps the

drought out and retains the moiſture; except the land be wet, then roll when the land is dry. Before hoeing I have a plough without any mould-board, two inches broad at bottom, and a ſhare with two wings ſet to the angle of forty-five degrees, broader or narrower as the drills are in breadth, to hoe between the drills. A man with one horſe will hoe three acres per day; the hand-hoers immediately follow. The firſt time hoeing coſts 5s. 4d. per acre: after the weeds are dead, the above plough is run through between the drills a ſecond time, and the ſecond hoeing follows, which coſts 2s. 8d. per acre (hoed to one foot diſtance). After the weeds are dead, a double mould-board plough, with a man and one horſe are employed to earth up the ſoil cloſe about the turneps, ſo as not to cover the tops, which preſerves the turneps from froſts much better than thoſe ſown on the top of drills.

Feb. 28th, 1799. The fortieth part of an acre drilled at two feet diſtance, the

ſame

ſame quantity on the eighteen inches drilled, the ſame quantity on the broad-caſt, were accurately ſet out by a neighbouring gentleman; the turneps drawn, and tops and roots cut off; and they were ſeparately weighed in the preſence of a magiſtrate, the curate of the pariſh, and ſeveral gentlemen; and the produce was as follows:

	lb.
One hundred and twenty-one ſquare yards, drilled at two feet diſtance, weighed	1438
One hundred and twenty-one ſquare yards, drilled at eighteen inches diſtance, weighed	827½
One hundred and twenty-one ſquare yards, broad-caſt, weighed	667½

Theſe quantities were taken from the middle of the field, where there was no perceivable difference. The broad-caſt was hoed to the ſame diſtance as the others, and as full ſtocked with plants, and as regular as the others, but ſmaller in ſize, the whole field being clear from weeds.

The great ſtorm of ſnow prevented me from weighing ſooner, and the froſt had ſpoiled part of them. I think if the ſame quantity had been weighed at the latter end

of November, 1798, they would have weighed one third more at leaſt. In my opinion the air confined between the drills after the tops meet, greatly aſſiſts the growth of the turneps, much more than in the broad-caſt way.

The two-feet drills are much the beſt all over the field: I have two other fields of turneps, one ſix acres, four of which were ſown broad-caſt; the other field eight acres, drilled: the drilled in both fields are double the quantity of the others.

The above comparative experiments are in my mind clearly deciſive in favour of drilling, as dry land ſuits the broad-caſt method; for in heavy moiſt ſoils, or thin or weak ſoils, the broad-caſt is not worth cultivating.

Remarks on the Cultivation of Turneps.

The moſt uſeful Soil for Turneps.

Rich loams, gravelly loams, ſandy loams, clayey loams, limeſtone gravel, whin gravel.

Inferior

Inferior Soils for Turneps.

Chalkey ſoils, gravelly ſoils, hazel ſoils. Theſe muſt be effectually under-drained; if not, they are not worth cultivating for Turneps.

Turneps ought never to be ſown upon ſtrong retentive clay ſoils, thin yellow ſandy ſoils, or thin white ſandy ſoils.

Preparing the before-mentioned Soils for Turneps.

The number of ploughings muſt be regulated according to the foulneſs of root-weeds, and tenacity of the ſoil, which muſt always be made as clean from weeds as poſſible, and as much pulverized as the nature of the ſoil will admit (as turnep-ſeed requires as fine ſoil as any garden ſeed). As to cleaning the land, every agriculturiſt is informed in what manner to perform that; as to plough the land, and roll ſtiff clotty ſoils frequently after harrowing is the beſt method I know of both in aſſiſting to pulverize, and to get out the root-weeds.

Manures.

The fold-yard and ſtable dung carted out into a proper place and covered over with ſoil, and turned after having laid a month or more, makes the beſt manure for Turneps I know of. I have, for many years, had good crops of Turneps by laying compoſts of ſoil and lime (in my uſing peat or black earth) upon ſandy or gravelly ſoils, ſixty cart-loads or more upon an acre. Lime is very little known as to the good qualities it produces as a manure: the ſmallneſs of the quantity laid upon an acre (as far as my obſervation has reached) has no more effect than if one cart-load of rotten dung was regularly ſpread upon an acre, owing to the different quality of lime. The richneſs of ſome lime has $\frac{1}{12}$ of calcareous earth in a cart-load; in other lime $\frac{1}{12}$ of ſand in a cart-load. What effect can two cart-loads of the latter, containing thirty-two Wincheſter buſhels per load have as a manure upon one acre? It would require

quire ten cart-loads of the latter to be laid upon an acre, to be equal to the former; the expence of which would be more than the value of an acre of good turneps. I have ſeen very good crops of turneps where three cart-loads of the former lime was laid upon an acre without any other manure. Such lime, where it can be had at a moderate expence, is a rich manure, and is found to be a great improvement when the land is laid down to graſs. As for the other manures, ſuch as night-ſoil, ſoap aſhes, &c. &c. theſe are local manures, and can be only had in quantities in large towns, &c. which only anſwers for individuals.

Sowing Turneps.

The beſt kind of turnep-ſeed I know of is the round white green top, and red for field turneps. If turneps are wanted to feed down early in autumn, begin to ſow about the 1ſt of June (if ſown ſooner, they run to ſeed before Martinmas), and continue ſowing

ſowing till the 12th of July: later ſowing ſeldom gets to a ſize worth ſtanding. One pound of well dreſſed ſeed is the quantity I always ſow upon an acre, both for drill and broad-caſt. The proper depth is two inches; if leſs covered, they are injured by drought, or waſhed bare with rain. The beſt prevention againſt the fly is thick ſowing and rolling early in the morning. I have always obſerved the rolled turneps improve much more than thoſe parts of the field which were not rolled. As to horſe-hoeing and hand-hoeing, I refer to the method uſed in the twenty-one acre field above. In my opinion, the beſt diſtance for drilling is *two feet:* if large turneps are wanted, two feet ſix inches, up to three feet: leſs than eighteen inches cannot be properly horſe-hoed, which is material to the growth of the turneps, as well as making a good clean fallow of the field.

Method

Method of Drilling.

A double mould-board plough ſhould go over the field, to form the ſoil into drills; the manure ſhould be immediately carted into the drills, and laid down in heaps, in the middle of each five drills, and women ſet to ſpread the manure with their hands, which they will do more regularly than men with forks, and with leſs coſt. As to level-drilling, I again refer to the twenty-one-acre field method.

Comparative advantage between Drill and Broad-caſt.

The advantage of drilling on good land is obvious, as the horſe-hoeing and hand-hoeing greatly aſſiſt the growth of of turneps; and when the tops meet from drill to drill, the air contained under the tops greatly aſſiſts the increaſing ſize of the turneps.

Of Drilling on inferior Soils.

The advantage in inferior ſoils, in my opinion, is ſo great, that forty years ago no turneps

turneps were ever attempted to be grown on any ſuch ſoils, when broad-caſt was the only method of cultivating turneps; at any rate a barbarous practice upon ſuch ſoils, and which ought entirely to be exploded, except in burnbating, provincially in this diſtrict called paring and burning. In drilling the above ſoils, raiſed drills in thin weak ſoils nearly double the thickneſs of the ſoil; and in moiſt ſoils the land is kept in a dry ſtate, and the turnep-ſeed ſown as on a hot-bed. Beſides the great advantage of horſe-hoeing, from the long experience I have had in the cultivation of Turneps, I am entirely in favour of drilling.

To preſerve Turneps for late Spring-feeding.

I have tried many different methods, viz. ſtoring them up in a houſe, ſtacking them with ſtraw after the tops and roots were cut off; digging holes in ſand, and covering them over; ploughing a furrow in the ſtubble, and laying them in it by the heels, and

and then ploughing another furrow upon them. The great expence and rotting of the turneps, made me give up the above methods; and after trying ſeveral more, none of them anſwered. I tried to ſtop the vegetation of the ſeed-ſtem; and in the middle of March, three years ago, I ſet two women with large knives to cut the tops of the turneps very cloſe, each woman cutting two rows at a time, going in the middle of two rows, and cutting the tops off right and left. On that day they cut one acre, which coſt 1s. 4d; the tops were laid in heaps, and carried off in baſkets, and given to the ſheep in the fold. The experiment anſwered above my expectation; the turneps were preſerved three weeks before they put out for ſeed-ſtems, which was round about where the top was cut off, and the turneps kept ſound. One night's froſt will deſtroy theſe tender ſhoots, and then they will have to make new ones again. I have continued this practice ever ſince, and have preſerved turneps to the middle

middle of May; when the ſheep never eat any of the turneps that were not cut, and very little of the ſtem in flower.

The ſoil where the turneps are cut is very little exhauſted by the roots of the turneps, which have no ſeed-ſtem to ſupport.

The ſoil is very much exhauſted where the ſeed-ſtem is ſuffered to flower, which is chiefly ſupported from the ſoil.

SIR,

WE whoſe names are hereunto ſubſcribed, do certify, that on the 28th day of February laſt, on the farm of Mr. M. Forſter, at Broomy Holme, in the pariſh of Cheſter-le-ſtreet, in the county of Durham, we viewed a crop of Turneps of twenty-one acres, or thereabouts, and that, from the ſame indifferently choſen, we meaſured off three equal portions, conſiſting of four perches each; namely,

Four drilled at two feet diſtance,
Four drilled at eighteen inches,
Four broad-caſt.

And

And after the roots and tops of the turneps were taken off, and cleaned, the produce of each portion, as above ſpecified, weighed as follows:

		Weight per acre.			
	lb.	Ton.	cwt.	qr.	lb.
Quantity drilled at 2 feet,	1438	25	13	2	8
Ditto ditto 18 inch,	827 ½	14	15	2	4
Ditto, broad-caſt	667 ½	11	18	1	16

Witneſs our hands, this 9th day of March, 1799, at Cheſter-le-ſtreet.

WILLIAM NESFIELD, one of his Majeſty's Juſtices of the Peace for the County of Durham.

ROBERT NELSON, Sub-Curate of Cheſter-le-ſtreet.

WILLIAM FEATHERSTONHAUGH.

GEORGE WARDELL.

Durham, April 5, 1799.

Mr. MORE.

In

In consequence of the following Papers, the SILVER MEDAL was this Session voted to the Rev. HENRY JEROME DE SALIS, D. D. the Candidate being precluded obtaining the GOLD MEDAL, which was the Premium offered for the CULTIVATION of PARSNEPS, for the purpose of feeding Cattle and Sheep, by the conditions required by the Advertisement having not been fully complied with, owing in some degree to the inclemency of the Season.

SIR,

I HAVE hitherto delayed my promised letter to you, upon the subject of my Parsneps, in the hope that I might be able, at one and the same time, to give you an account both of the quantity of land on which I have cultivated them, and of the amount and application of the produce. The frost, however, has prevented me from taking up the roots upon more than four

four acres out of ſix, that I appropriated to parſneps. Theſe four acres are a ſtrong argillaceous loam, which from the beginning of the autumnal rains was not in a condition to bear carting. I have the ſatisfaction however to know that the froſt, though very ſevere in this place, has not hurt the roots; ſo that I have them in reſerve for my fatting ſheep, and ewes, and lambs, at the return of the open weather. The two acres and a fraction were of a ſandy loam: the crop on this land, owing to the great drought in the ſpring, was a very ſhort one. Of the application of that, however, I am able to ſpeak in part: a very fine Yorkſhire ſhort-horned heifer was ſtalled, quite lean, and fed from the beginning with parſneps and very fine clover hay. It was ten weeks laſt Saturday, (the 2d of February) that ſhe was put up: ſhe took to them immediately, and for the firſt fortnight ate about ſixty pounds per day, together with a conſiderable quantity of clover hay. I then increaſed her quantity of parſneps to about one hundred pounds daily: ſince that increaſe, ſhe has not eaten more

than five or six pounds of hay, and she has drunk much less. What she has continued to drink in the day is about four gallons. She is tended by a very careful and experienced feeder, who told me at the end of the first week, that she began to thrive; and he has ever since continued to say, that in all his experience he never saw such improvement as this food has made on her. Some of the first graziers of this country, perfectly skilled in the effects of oil-cake, have separately seen her, and told me afterwards that oil-cake could produce no such effect. She will be completely fat by Easter; and if she is, the proposition of the Jersey Board of Agriculture, that a beast from quite lean will be rendered quite fat by parsneps in three months, will, in this instance, be nearly verified. Indeed, if she was to be killed now, it would be verified; for she is now fat.

I am, SIR,

Your obedient servant,

H. J. DE SALIS.

Wing, near Leighton Buzzard,
Feb, 8th, 1799.

MR. MORE.

SIR,

THE land upon which the parſneps were cultivated, has been accurately meaſured by a regular land-ſurveyor, Mr. Long, of Fenny Stratford; and four acres and a fraction of it, which is in this pariſh, were alſo meaſured with the reſt of the pariſh, by the ſurveyors appointed for the late incloſure. I am ignorant of the forms required by the Society, to be obſerved upon theſe occaſions; but as the paper which you gave me in June laſt ſtates, that Certificates ſhould be given in on the ſecond Tueſday in February, 1799, it is now rendered impoſſible by the weather, and the extreme badneſs and danger of the roads, from obſerving that condition.

To the account given to you in my laſt letter, of my Yorkſhire ſhort-horned heifer, which has had parſneps only, with a little clover hay for her food, I am now able to add, that a butcher whoſe judgment is acknowledged throughout the country, has

this morning pronounced the heifer completely fat; so that the proposition of the Jersey Board of Agriculture, to which I alluded, and which may be seen in the Volume of communications of our Board of Agriculture, viz. that a beast from quite lean will become quite fat at the end of three months, if fed with parsneps and hay, is completely verified.

I am, SIR,

Your most obedient Servant.

H. J. DE SALIS.

Wing, Feb. 11, 1799.

Mr. MORE.

SIR,

AGREEABLY to my promise, I now inform you, that fifty fatting wethers, which had been disappointed of their turneps by the severity of the frost, have been

been regularly ſerved with parſneps, to the amount, upon an average, of 420lb. a day, during ſeventeen days, including this. They immediately all but two took to them; and one of the two had a ſore mouth, which diſabled him from eating any but the ſofteſt meat. At firſt, however, the greateſt part of them ate this new food with diffidence, whilſt ſome of them, from the beginning, ſhewed a decided taſte for it. By degrees they all acquired the ſame taſte, and they now all of them ſhew the moſt marked impatience for their times of being ſerved. They feed greedily, but appear to be ſoon ſatiated. In the mean time, they are viſibly improving, and there is no doubt of their being ſoon ready for the market. Should any thing worth your attention occur during their progreſs, you ſhall hear farther from me.

The cow will be killed in the courſe of this, or in the beginning of next week. She has improved very much ſince the time of my laſt writing to you, and is now of

the degree of fatneſs expected in our markets a little before Eaſter. The only circumſtance relating to her that has occurred ſince I laſt wrote is, her having eaten more parſneps and leſs hay, ſince ſhe has been regularly ſerved with the roots freſh from the ground. I believe I mentioned to you before, that for ſome time ſhe did not eat the quantity of parſneps ſhe had done, but that ſhe ate more hay. The parſneps with which ſhe was then ſerved, had been dug up ſoon after Michaelmas.

I am, SIR,

Your obedient Servant,

H. J. DE SALIS.

Wing, March, 10, 1799.

Mr. MORE.

The

The Thanks of the Society were this Seſſion voted to THOMAS SKIP DYOT BUCKNALL, Eſq. for the following Communication relative to the Cauſe of BLIGHT on FRUIT-TREES, and which may not improperly be conſidered as a ſupplementary Paper to the Letters on Orcharding by that Gentleman, already inſerted in ſeveral Volumes of the Society's Tranſactions.

SIR,

I BEG you to preſent my compliments to the Society for the Encouragement of Arts, Manufactures, and Commerce; and acquaint them, that to gain information on the cauſe of decay in engrafted fruits, and make the ſyſtem of Orcharding which they have patronized and honoured by publiſhing in their Tranſactions, Volumes 11th, 12th, 13th, and 14th, as perfect as is in my power, I ſpent the month

month of September 1797, in Gloceſter-ſhire, had much converſation with perſons the beſt informed on the ſubject of fruits, and found it a general regret, that the *valuable old varieties* of cider-fruits are moſtly gone. The *Stire* is in the laſt ſtage of decay; yet, from the appearance of thoſe trees now totally worn out, they muſt have been, in their meridian health, *Noble-trees*. The *Redſtreak* is nearly gone, and there are many well-grounded fears entertained for the *Golden Pippin*. The *Fox-whelp* ſtill remains in full bearing, with many other of the valuable varieties in different ſtages of health.

This information, collected on the ſpot, it is requeſted the fruit-growers will attend to; for I am perſuaded, had my ſyſtem of orcharding been introduced fifty years ago, many of the loſt varieties might have been now in health: and by attending to that ſyſtem, thoſe ſtill remaining may be retained much longer than in a ſtate of unaſſiſted nature. In my firſt paper I ſtrongly recommended

commended to the planters to chooſe the ſorts which thrive in the neighbourhood, or are in health and full bearing in the country from whence they are to be brought; and from further experience I more clearly ſee the neceſſity of this injunction.

Shakeſpeare ſays, "There is a tide in the affairs of men;" may I apply the thought to fruits? There appears at preſent a criſis in the ſtate of Apples; all the varieties of the Ruſſets and Pearmains, with many others, are wonderfully going off. In a former paper I mentioned the Maidſtone diſtrict as abounding in valuable fruits; they have materially failed from blight during the laſt three years. Several of the neighbours in Eaſt Farleigh took me to examine the reſpective plantations, and pointed out one orchard of about three acres, which produced the moſt beautiful crop; a finer parcel of fruit could not have been ſhewn. We each concurred in the cauſe; it is explained in the Orchardiſt, and would be repetition here, *actual health ariſing from ſhelter, and cattle paſſing over the ground.*

During

During the many years I was engaged in forming the Orchardiſt, I would not ſuffer a word to be taken from a book, for copyiſts are apt to miſtake: all my obſervations are drawn from nature. But now I cannot expatiate on the ſyſtem of the old varieties, better than is done by Marſhall, an author of deſerved repute, who, in his Rural Economy of Gloceſterſhire, publiſhed in 1789, Volume II. page 239, remarks: "Engrafted fruits are not permanent, they continue but for a time."

T. A. Knight, Eſq. in his Treatiſe "On the culture of the Apple and Pear," has ſhewn a wonderful and truly ſcientific regard for the recovery of the valuable old varieties, &c. and is now rationally attempting to produce new varieties, equal or ſuperior to thoſe we regret the loſs of; and for the benefit of the world, I take the liberty of introducing an extract from a treatiſe he has publiſhed at Ludlow.

In page 6 he ſays: "The apple is not the natural product of any ſoil or climate, but owes its exiſtence to human art and induſtry

induſtry. The firſt varieties were no doubt introduced from the Continent: the continuance of every variety appears to be confined to a certain period, during the early part of which *only* it can be propagated with advantage to the planter."

Mr. Knight, with a view to ſecure ſome new valuable varieties, ſays in his excellent work, "I prepared ſtocks of the beſt kind of apple I knew, and planted ſix againſt a ſouth wall, in extremely rich mould."

Thus far Mr. Knight, through the whole of whoſe treatiſe there is much information. I allow that theſe ſix trees are the moſt beautiful both in ſtem and leaf I ever ſaw; and am ready to confirm the opinion, that they promiſe ſucceſs: the ſorts are, the *Golden-pippin*, *Foreſt-ſtire*, the *ſmall rich Marden apple*, a very rich aſtringent yellow (but not acid) crab, and the yellow Siberia crab. Theſe trees are planted to grow free and fine, that the fruit may be in the higheſt perfection, to produce valuable ſeed for raiſing new varieties; and the bloſſoms were regularly

regularly croſſed according to the ſexual ſyſtem of plants, with the ſame attention as a nobleman would give to improve his breed of brood mares and colts, chooſing the beſt qualities in each, as far as nature will admit. As varieties are terms hardly thought of out of the cider countries, and little underſtood there, I beg indulgence farther to elucidate them as follows: Secure a new valuable kernel fruit, and from that engraft as beſt ſuits your ſentiment. Allow me to call the firſt tree primogeneous, or *ſtock:* all the grafts taken from this, or any of the deſcendants, will, for ſome generations, thrive; but when this *firſt ſtock* ſhall, by mere dint of old-age, fall into actual decay, a nihility of vegetation,—the deſcendants, however young, or in whatever ſituation they may be, will gradually decline; and from that time it would become imprudent in point of profit to attempt propagating that variety from any of them. This is the dogma which muſt be received: I do not expect a direct aſſent, neither do I

wiſh

wiſh it, for it ſhould be taken with much reſerve. I only hope that I have fully explained the ſyſtem: it is a received opinion that a variety of apple may, according to its hardineſs, continue from one to two hundred years, the pear longer. My friend Mr. Knight allows care and attention may preſerve a tree perhaps half as long again, as when left to unaſſiſted nature. Grant me this, and I aſk no more: let thoſe who doubt make the actual experiment, and the very attempt will carry conviction.

To thoſe unacquainted with the term *variety* as applied to orcharding, I cannot define or explain it better than a valuable new apple raiſed from ſeed pip, or kernel, which has been fortunately preſerved by the diſtinction of the planter, and ſelected by him from ſome good appearance in the leaves, free growth of the wood, or beauty and ſtraitneſs of the ſtem. Such a tree out of the cider countries is termed kernel fruit, that is, an unengrafted tree; and the apple commonly takes its name from

colour

colour or ſome inherent quality, as golden-pippin, ruſſet, cat's-head, &c.; or from the place where it was raiſed, as Farleigh pippin, New-Town pippin, Court of Wick pippin. This laſt is mentioned by Mr. Billingſley, in the Somerſet Report, page 124, as a new variety, and a favourite apple. In that neighbourhood, he ſays, "it originated from the pip of the golden pippin, and may be conſidered as a beautiful variety of that fruit. In colour and flavour it has not its ſuperior. The tree is large, handſome, ſpreading, and a luxuriant bearer, and on the whole cannot be too ſtrongly recommended." The apple I ſaw at the Board of Agriculture, but then it was decayed by being over-kept. His Excellency Rufus King ſent me a preſent of the New-Town pippin, and what he called the Greening. I wanted the New-Town pippin for the kernels; but when the fruit was cut, it was obvious, from the ſize of the pips, that the fruit had been gathered long before it was ripe, the better to con-

vey

vey it by ſea from America. It does not ſeem to ſuit our climate as yet, except in warm ſituations, though I have heard it highly praiſed by the Americans. Miller remarks, a little proper attention will naturalize many foreign plants. I am ſure it is wonderful how many different ſpecies of plants have been naturalized within my time. The moſt effectual way of doing it, is to keep the plants in health, and harden them by degrees.

Mr. Knight's ſyſtem and mine are in uniſon. He, as it were, attempts to create; I, to preſerve. Conſider, what do I recommend? To ſecure ſhelter—deſtroy the moſs—heal the wounds—check the baneful effects of canker—ſtop the oozing of gum; and by manuring the land, pruning and waſhing the tree, make it healthy, if it is not ſo old as to have loſt the energy of growth. Fruit-trees may bear for years after growth has become almoſt ſtagnant; then the knife can do but little, nay, would be miſchievous, if it lets in the cold winds. Medicine may keep a palſied man alive,

but

but nothing in the healing art will make him young: therefore, what is attempted by way of ſcience, ſhould be begun in the early ſtages of the plantation, and ſo go on to the extreme of old-age.

Thoſe the leaſt converſant with vegetation know that the operations are nearly uniform. This induces me to mention, that in Hampton-Court Gardens there is a vine of the Black Hamburgh, which fills a houſe 72 feet long, and 18 feet over, making an area of 1300 feet ſuperficial of glaſs, under which there are more than 1800 bunches of grapes, all from one ſtem; and what is worthy obſervation, the branches fartheſt from the root produce the largeſt and cleareſt fruit. This vine is every year productive, merely from pruning, waſhing, and cleaning. The bunches are in the ſpring as regularly ſet out, and with as much attention, as the turnep-hoer ſets out his field crop. An incumbered tree never can attain its full ſize, or be in health; for when the free circulation of the ſap is checked,

checked, the tree becomes diſeaſed, and moſt of the inward branches are torpid or rotten: in this ſtate there remains no remedy but cutting them out. Now conſider what a misfortune in orcharding to have the powers of vegetation ſo loſt, which properly directed would have kept the tree in health. My intention in introducing the vine here, is to *aver*, that to whatever ſize nature can carry a fruit-tree by the aſſiſtance of pruning, waſhing, care, and ſhelter, ſuch tree is capable of growing much larger, and from that muſt of courſe acquire better health. May I ſay, growth and health are almoſt ſynonymous? for, where there is a freedom of growth, ſuch tree is little affected with canker or gum; neither would it be ſo much injured by inſects, who, by preying on the leaves and bloſſoms in the ſpring, are now known to be a material cauſe of blight. I wiſh to enforce that actual health would in ſome meaſure prevent blight.

There are many letters in my poſſeſſion corroborating the opinions above advanced reſpecting the preſervation of Fruit-trees, which will be publiſhed when theſe papers are collected.

Blight.

It ſhould be underſtood from the Orchardiſt, that each ſtep regularly tending towards bringing the tree into health, muſt be ſo far operative in preventing blight. Let us attempt to aſcertain from what blight ariſes: I ſhould ſuppoſe that whatever has a tendency to prevent the due impregnation of the bloſſoms, or injure the foliage of the tree, will in a certain degree cauſe blight. The farmers ſay my trees are blighted, and ſome of them imagine the inſects are brought over in thick hazy clouds: be aſſured the flies, grubs, moths, inſects, &c. do not come over in the winds from the Continent, but are bred at home from the eggs being depoſited about the tree in ſummer and autumn. And reſpecting

ing cold, it is not ſo much the intenſe cold which does the miſchief, as an alternate ſucceſſion from heat to cold: for when the ſun has rarified and expanded the air within the air-veſſels, then the ſucceſſion of froſty nights, heavy rains, cold winds, with ſnow or ſleet after a warm day, greatly tend to check the growth of the tree; and from the preceding warmth, theſe cauſes have more power to deſtroy the delicate formation and expanſion of an infantine vegetation, and prevent a due impregnation of the bloſſom without which there can be no fruit. Cold under-water, or land ſprings, ſtunt the tree, and cauſe blight. Long drought, with drying winds, injure the farina, ſo that it imperfectly performs the office nature has deſigned it for. Other cauſes may prediſpoſe the tree to blight, as an overabundant crop the preceding year, which ſo exhauſts the vital principle, that the tree has not ſufficient ſtrength to mature the fruit, and fill the bearing buds for the next ſpring: a want of free circulation of air cauſes blight.

Under any of the foregoing ſtatements, ſhould the trees be old, in a declining ſtate of health, or the branches covered with rotten bark, moſs, &c. under which inſects may have depoſited their eggs; the eggs may alſo be within the buds, or worked round in ringlets on the laſt year's ſhoots. I ſay, let the eggs be where they may, *ſwarms of depredators* will certainly iſſue to deſtroy the weakly foliage. On the the contrary, where the trees are clean, and in health, inſects are not ſo numerous, neither are they capable of being ſo deſtructive; for ſhould they devour part of the opening buds and leaves, a healthy tree will have ſufficient ſtrength remaining to produce a ſlight crop of fruit. Young ſtock poorly kept through the winter, in a ſtraw yard, ſhall be covered with vermin; when the ſtock are turned into good paſture, and acquire health, the vermin drop off; not that they are tired with their ſituation, but the health of the creature will not allow them to continue any longer there. Simi-

lar

lar circumſtances are known to attend the trees.

Obſerve, when rational means are made uſe of to give energy of growth to ſtandard fruit-trees; ſhould the tree acquire the growth, the rotten bark, moſs, &c. ſhall from that time gradually fall off, juſt as the vermin drop from the cattle. Theſe are known facts, and eaſily tried: to account for them, ſay, the cattle and trees are only getting into better health; this is the governing principle in both caſes. As one means of eſtabliſhing health in old trees, I recommended rubbing them over with oil: Mr. Fairman, has for ſome time uſed oil to good effect; and I ſhould now ſay, mix a little ſulphur or tobacco-duſt with the oil, to give it the conſiſtence of thin paint, which would have a tendency to offend the inſects, and drive them from the trees. It is obſervable, theſe little creatures are particularly delicate and careful in chooſing proper places to depoſit their eggs, and ſecure ſuch a nidus as may be fitting for the preſervation of their future progeny.

I, ſeven years ago, bought, by way of experiment, a handſome young tree, of the old varieties, the Nonſuch; and planted it in a proper ſituation, ſaying it ſhould not canker. The tree is now as clean and perfect as poſſible, merely from pruning and waſhing with ſoap-ſuds, and not permitting much fruit to grow, thinking it prudent firſt to form the tree before we expect the fruit.

I mentioned ſulphur or tobacco-duſt; but there are many cheap drugs, which could be eaſily applied to this purpoſe, particularly the bitter aloes. If thoſe concerned would only order one large old detached tree to be made perfectly clean, it may be ſoon proved whether the idea will anſwer; at the ſame time a good coat of manure ſhould be thrown over the ground as far as the roots extend.

No miſchief ariſes to fruit-trees until the warm weather commences, becauſe, before that period, inſects are not hatched; but the ſame degree of heat, which will cauſe the

the ſap to flow through the branches, and ſet the roots to work, is ſufficient to hatch many of the inſect tribe: others come out afterwards, and continue till near Midſummer, by which the foliage is moſtly eaten up. From this the planter runs a hazard for the next year, as there is hardly time from Midſummer for the tree ſo to recover as to fill the bearing buds, to produce a crop. I hope, with the aid of a little conſideration, I have nearly proved that the inſects for the moſt part produce the miſchief.

I remain, SIR, with many good wiſhes for the continued proſperity of the Society,

Your moſt obedient ſervant,

THOMAS SKIP DYOT BUCKNALL.

Hampton Court, Nov. 30, 1798.

Mr. MORE.

PAPERS IN POLITE ARTS.

POLITE ARTS.

In the Sixteenth Volume of these Transactions, page 279, is inserted a DISSERTATION by Mr. TIMOTHY SHELDRAKE, on PAINTING IN OIL, in a manner similar to that practised in the ancient Venetian School. What now follows is a continuation of Mr. Sheldrake's Paper, and gives an account of the Process used to separate the Mucilage from Linseed Oil, &c. so as to fit them to serve as vehicles in that manner of Painting.

Account of the Process used to separate the Mucilage from Linseed Oil, &c.

I HAD read in some book, the title of which I do not recollect, that Linseed Oil might be *purified* by shaking it with water which would imbibe the impurities, and leave the oil more limpid. I tried this experiment by shaking linseed oil with warm water,

water, and was ſurpriſed to find they did not ſeparate, but remained united in the form of emulſion. I then boiled them together, and found their tendency to ſeparate diminiſh: as it is the known property of gums or mucilage to keep oil and water united in this ſtate, I was induced to ſuſpect the preſence of mucilage in linſeed oil.

I had read in Doſſie a method of preparing what he calls *fat oil*. It is effected by placing linſeed oil in a ſhallow veſſel expoſed to the heat of the ſun, and ſtirring it frequently: in a certain time it loſes its property of drying, thickens, and acquires a degree of tenacity that makes it proper for a ſize or cement for gilders, &c. A ſimilar ſubſtance is alluded to by Leonardo da Vinci.

Taking the exiſtence of mucilage in this oil for granted, I conjectured that the alteration produced in its texture by Doſſie's proceſs, aroſe from the evaporation of ſome of its principles, and the more intimate union

union of the reſt in conſeqence of that evaporation: to verify this conjecture, I tried the following experiment.

I filled a half-pint phial full of linſeed oil, corked and tied it ſecurely over with a bladder. This I expoſed to the heat of the ſun in ſummer, during the whole day: after it had remained a few days in this ſituation, the upper part of the phial was covered with drops, ſimilar to thoſe produced by holding a wet bottle to dry before the fire. I then ſhook it well, which made the contents look muddy, and ſet it to reſt again. After a time it became clear, and a portion of tranſparent liquor like water lay at the bottom. I then repeated the ſhaking and ſetting it to reſt, till no additional quantity of this fluid was ſeparated.

By trying this experiment repeatedly upon oils procured from different places, I found that ſome oils afforded much more mucilage than others. From ſome I ſeparated a third part of mucilage; from others, a pint would not afford more than

a table

a table ſpoonful, and ſometimes leſs. Whether this difference in the reſult was radically in the oils, or from a difference in the proceſſes conducted by means ſo variable as the heat of the ſun, I am not able to aſcertain.

Upon trying the ſame experiment with nut and poppy oil, I found the ſame reſult, but in a different degree. The average quantity afforded by nut oil was, I believe, not more than a third part of the average of linſeed oil; and the average of the poppy oil was not ſo much as a ſixth. In ſome caſes, particularly of the poppy oil, I did not obtain any.

The colour of the oil always diminiſhed as the mucilage was abſtracted; but the mucilage was always as colourleſs as water. It is a queſtion I will not pretend to decide, whether the colour of theſe oils depends upon the preſence of the mucilage, or upon any other principle which is deſtroyed by the action of light. I have in ſome inſtances had the oil as colourleſs as water.

This

This decompoſition of the oils, if it may be ſo called, is curious, as proving the exiſtence of mucilage in them; but as it is very troubleſome, may it not be adviſable to prefer thoſe which have naturally the leaſt mucilage in their compoſition?

After pouring the oils from the mucilage, I put ſeveral quantities of the latter together, and found them mix without any difficulty. I mixed this mucilage with water, and found it unite with it in any proportion without becoming turbid. I laid it upon plates of metal, expoſing them to dry in the ſun, and before the fire, and when dry waſhed them with a ſpunge and water; but it ſhewed no tendency to diſſolve; though, while in a liquid ſtate, it ſeemed to poſſeſs all the properties of a gum.

As the proceſſes by which I diſſolved the amber and copal to make the oil varniſhes, are to be found in many books, and as it will be better for artiſts to purchaſe than attempt to make thoſe varniſhes, it can ſcarcely be thought neceſſary to detail thoſe proceſſes

proceſſes here: but as I believe the methods by which I diſſolved the copal in ſpirit of turpentine and ſpirit of wine, are not known, I ſhall now ſubjoin them.

To diſſolve Copal in Spirit of Turpentine.

N. B. Whatever quantity is to be diſſolved, ſhould be put into a glaſs veſſel capable of containing at leaſt four times as much, and it ſhould be high in proportion to its breadth.

Reduce two ounces of copal to ſmall pieces, and put them into a proper veſſel. Mix a pint of ſpirit of turpentine with $\frac{1}{8}$ of ſpirit of ſal armoniac; ſhake them well together; put them to the copal; cork the glaſs, and tie it over with a ſtring or wire, making a ſmall hole through the cork. Set the glaſs in a ſand heat ſo regulated as to make the contents boil as quickly as poſſible, but ſo gently that the bubbles may be counted as they riſe from the bottom. The ſame heat muſt be kept up exactly till the ſolution is complete.

It

It requires the moſt accurate attention to ſucceed in this operation. After the ſpirits are mixed, they ſhould be put to the copal, and the neceſſary degree of heat be given as ſoon as poſſible. It ſhould likewiſe be kept up with the utmoſt regularity. If the heat abates, or if the ſpirits boil quicker than is directed, the ſolution will immediately ſtop, and it will afterwards be in vain to proceed with the ſame materials; but if properly managed, the ſpirit of ſal ammoniac, will be ſeen gradually to deſcend from the mixture, and attack the copal which ſwells and diſſolves, except a very ſmall quantity which remains undiſſolved.

It is of much conſequence that the veſſel ſhould not be opened till ſome time after it has been perfectly cold. It has twice happened to me, on uncorking the veſſel when it was not warm enough to affect the hand, that the whole of the contents were blown with violence againſt the cieling. It is likewiſe important that the ſpirit of turpentine ſhould be of the beſt quality. I have

never ſucceeded with that which is ſold at the colour-ſhops; but whenever I procured my ſpirits at Apothecaries Hall, I have diſſolved the copal by the proceſs I have deſcribed, without difficulty.

This varniſh is of a rich deep colour when viewed in the bottle, but ſeems to give no colour to the pictures it is laid on: if left in the damp, it remains ſacky, as it is called, a long time; but if kept in a warm room, or placed in the ſun, it dries as well as any other turpentine varniſh; and when dry, it appears to be as durable as any other ſolution of copal.

To diſſolve Copal in Alcohol.

Diſſolve half an ounce of camphire in a pint of alcohol; put it in a circulating glaſs, and add four ounces of copal in ſmall pieces; ſet it in a ſand heat, ſo regulated that the bubbles may be counted as they riſe from the bottom; and continue the ſame heat till the ſolution is completed.

Camphire

Camphire acts more powerfully upon copal than any ſubſtance that I have tried. If copal is finely powdered, and a ſmall quantity of dry camphire rubbed with it in the mortar, the whole becomes in a few minutes a tough coherent maſs. The proceſs above deſcribed will diſſolve more copal than the menſtruum will retain when when cold. The moſt economical method will therefore be to ſet the veſſel which contains the ſolution by, for a few days; and when it is perfectly ſettled, pour off the clear varniſh, and leave the reſiduum for a future operation.

This is the brighteſt ſolution of copal that I have ſeen: it is an excellent varniſh for pictures, and may, perhaps, be found to be an improvement in fine Japan works; as the ſtoves uſed in drying thoſe articles may drive off the camphire entirely, and leave the copal pure and colourleſs on the work.

N. B. Copal will diſſolve in ſpirit of turpentine by the addition of camphire, with

the ſame facility, but not in the ſame quantity, as in alcohol.

At the time I determined to lay the preceding papers before the Society, I conceived that the quick and certain manner in which the vehicle dried, was one of its advantages: but as that circumſtance has been objected to, and in ſome caſes really is a diſadvantage, I have ſince endeavoured to remove that objection by the following proceſs.

Put a pint of nut or poppy oil into a a large earthen veſſel; make it boil gently upon a ſlow fire; put in by degrees two ounces of ceruſe, and ſtir it continually till the whole is diſſolved.

Have ready a pint of the copal oil varniſh heated in a ſeparate veſſel; pour this by degrees into the hot oil, and ſtir them together till all the ſpirit of turpentine is diſſipated; let it then be ſet by till cold, when it will be for uſe.

It is obvious that as this is a compound of the copal varniſh with the leaſt exceptionable

tionable of the drying oils, it will partake of the properties of each of its component parts. It gives leſs brightneſs and durability to colours than the varniſh will, but more than oil: but as it certainly may be uſed in painting in the ſame manner as any other drying oil, and gives more brightneſs and durability to colours than they can derive from any other oil, it is not unreaſonable to ſuppoſe that it will prove an advantageous vehicle.

I have mentioned ſpecific quantities of the ingredients; but it is eaſy to ſee that the relative proportions may be varied according as it is required to dry faſter or ſlower. It muſt be remarked too, that whenever the mixture is to be made, both the ingredients ſhould be hot, becauſe, if either of them is cold, the mixture becomes turbid, and a part, often the whole of the copal, is precipitated: but this inconvenience is avoided, by mixing and boiling them together, as I have directed. It muſt likewiſe be obſerved, that after ſome time a ſpontaneous alteration takes

place, which diminiſhes, and at laſt deſtroys the drying quality of this mixture: it will therefore be adviſable to uſe it freſh, or at leaſt not to uſe it after it has been made more than a month or ſix weeks.

The

The Society this Seſſion having received from Mr. NICHOLSON, of Ripon in Yorkſhire, a DRAWING, intended as a Specimen of the Proceſs for producing the Lights in ſtained Drawings, by removing, after the Shadows are waſhed in, the Colour where the Lights are required, giving by this means the effect of Body Colour with greater clearneſs, and without any of its diſadvantages; and it appearing that Mr. NICHOLSON's Method of tinting Drawings promiſes to be of uſe in the practice of Drawing in Water-colours, and produces a more ſpirited effect; the Society agreed to Mr. NICHOLSON's Propoſal, and purchaſed from him, at the price of Twenty Guineas, the complete Proceſs for performing the Work, as communicated in the following Paper.

Proceſs for producing the Lights in ſtained Drawings, by Mr. Francis Nicholſon, of Ripon, Yorkſhire.

THE difficulty of preſerving the lights in ſtained drawings with freedom and preciſion, is ſo univerſally felt by thoſe who

cultivate that branch of the arts, the practice of which is every day growing more extenſive, that the ſtatement of this circumſtance alone is ſufficient for the introduction of the following proceſs, by which that difficulty is removed, and by which all the effect of body colour may be obtained, without any of its inconveniences or defects. It is applicable to every ſubject, to the richneſs of foliage, of rocks, or of foreground; and in ruins, their moſt pictureſque appendages of hanging ſhrubs, weeds, &c. may be expreſſed by it with the utmoſt ſharpneſs, and with all the lightneſs and freedom of which body colour, or oil painting, are capable.

The principle of this proceſs conſiſts in covering the places where the touches of light are intended to be, with a compoſition not liable to be diſplaced by waſhing over it with the colour, and ſuch as may be afterwards removed by a fluid in which the colours uſed in water are not ſoluble.

This

This compoſition or ſtopping mixture is made by diſſolving bees-wax in oil of turpentine, in the proportion of one ounce of wax to five ounces of the oil; and, as near the time of uſing it as may be convenient, grind with the pallet-knife as much flake white, or white-lead, in oil of turpentine, as may be wanted at one time; dilute it with the above ſolution until it will work freely with the pencil, and appear on the paper, when held between the eye and the light, to be opake. It is neceſſary to obſerve this, or the firſt touches will not be ſufficiently viſible, after being waſhed over with the colours, to aſcertain the places of the ſecond. It is alſo neceſſary to uſe a frame inſtead of the drawing-board, or to paſte the paper on the frame of the drawing-board, ſo as to remove the pannel; becauſe the firſt and ſecond touches muſt be put on with the drawing placed between the eye and the light, as they will be moſt viſible in that ſituation. On this frame paſte the paper wet ſo as to dry firm: when quite dry, draw the outline, and proceed as follows:

1ſt, With

1ſt, With a fine ſmall hair pencil, and the ſtopping mixture, cover thoſe places where the clear whiteneſs of the paper may be wanted, except in the ſky: let it dry a few minutes; then wet the paper on both ſides, and while it is wet waſh the ſky. The ſhadows of the clouds, diſtances, and general breadths of ſhadow, muſt be put in with the grey tint; and over the places of the light waſh the tints of the brighteſt light; thoſe will be generally yellow oker, or light red.

The light of the clouds may be preſerved ſharp by preſſing on that part a piece of tiſſue-paper, previous to the waſhing of the ſky; this, by abſorbing the ſuperfluous moiſture, will prevent the colour from ſpreading farther than is deſired. Suffer the whole to be very dry; and

2dly, Touch in with the ſtopping mixture the ſharp and prominent parts of the brighteſt lights; let them dry a few minutes, then waſh over them with the tints of the next degree of light.

3dly,

3dly, Stop with the mixture the ſecond order of touches, and waſh over them with the middle tints; ſtrengthen alſo at the ſame time the breadths of ſhadow.

4thly, Stop with broad touches of the mixture the places of the middle tint, uniting them to the former touches, and extending them ſo as to graduate the middle colours into the ſhadow: ſtrengthen the ſhadows, making them nearly as dark as they are intended to be, and let the whole be perfectly dry.

Then take oil of turpentine, and with a ſponge, or hog's-hair pencil, waſh over the places where the mixture has been uſed, rubbing it with the bruſh until it be diſſolved: clear it away with a linen rag, and waſh it with more oil of turpentine ſo long as any white lead appears; then let it dry.

Warm the drawing; then with a ſoft bruſh, and highly rectified ſpirit of wine, waſh the places where the oil of turpentine has been uſed, to clear away the remainder of it: rub the drawing lightly on the face, but ſponge it well on the back.

When

When dry, tint down the lights where it may be wanted; harmonize the colouring, and cut the ſhadows to effect, with ſtill darker tints as may be neceſſary.

If other touches of light ſhould afterwards be wanted in the ſhadowed parts, the colour may be eaſily removed by a pencil formed of ſponge, with water ſufficiently to produce them with as much ſtrength as can be deſired; then ſtop them with the mixture; waſh the ſhadow over the touches, bringing it to the colour taken off; and when dry, remove the mixture with the oil of turpentine and ſpirit of wine.

The Society having this Seſſion received two BUSTS modelled in CLAY, and two CASTS in PLASTER OF PARIS, all executed by Miſs KNIGHTS, of Sticken, in Buckinghamſhire, hardened by Wax in ſuch manner that thoſe in Clay repreſent Bronze, and thoſe in Plaſter, Marble, preſented their GREATER SILVER PALLET to theſe ingenious young Ladies, from whom the following Method of thus hardening the Clay and Plaſter was received; and the Buſts are reſerved in the Society's Collection.

SIR,

WE have taken the liberty of getting a friend to convey to you two Buſts, one of a bronze, and the other of a marble colour. The former is compoſed of clay, and the other of Plaſter of Paris: they are each wrought up to their colours by wax only,

only, and conſidered good likeneſſes of ourſelves.

Our only motive in getting them preſented, is to have the opinion of the Society as to what we think an improvement in producing likeneſſes, with a diminution of labour and expence.

We remain very reſpectfully,

SIR,

Your obliged humble ſervants,

L. and M. KNIGHT.

SAMUEL MORE, Eſq.

The method of giving clay models the appearance of bronze, and hardening caſts in plaſter, is ſimply by waxing them:—which is done by making the clay model moderately hot by the fire, and then pouring melted bees-wax on it, and continuing to

to do ſo till ſuch time as the colour becomes ſufficiently dark.

Caſts in plaſter muſt not be made nearly ſo hot as the clay models; the wax muſt be of the pureſt ſort; and the caſt muſt be dipped into the veſſel of melted wax.

PAPERS
IN
MECHANICKS.

MECHANICKS.

In the Year 1796 the Society voted their GOLD MEDAL to Mr. ROBERT HYNAM, of St. Peterſburg, for his INSTRUMENT FOR GAUGING CUTTERS FOR WHEELS for the uſe of Clock and Watch-makers, on condition that he ſent a complete Inſtrument, and the Calculations he had made for it, to the Society for the uſe of the Public; and this Seſſion the Inſtrument and the Volume of Calculations having been received, the GOLD MEDAL was ſent to Mr. HYNAM. His Letters on the ſubject, with Plates of the Inſtrument, are here inſerted; and the Inſtrument itſelf, with a Volume of his Calculations, are reſerved in the Society's Collection.

MY LORD,

I TAKE the liberty of addreſſing myſelf to your Grace, in a matter (I preſume) of real utility to Clock and Watch-makers,

and indeed in all mechanical performances where wheels are uſed with teeth. It need not be diſſembled, that they do many things by rote and gueſs, which might be performed with more certainty and more expedition, by calling in the principles of arithmetic and geometry, not to ſay of mechanicks. Of this nature ſeems to be the uſing of cutters in gauging a given number of teeth in a wheel of a given diameter. Now the diameter of a circle being to its circumference nearly as 1 to 3 (which ratio may be accurate enough for the purpoſes here meant), a wheel of ſix inches diameter will have about eighteen inches in its circumference. Since then, in cutting a number of teeth in a wheel, you are to have as many interſtices or ſpaces between the teeth as the teeth themſelves, you will therefore have twice as many diviſions in the circumference as the number of teeth; viz. one half of the diviſions for the teeth themſelves, and the other half for the ſpaces between. You need then only to divide

the

the circumference into twice the number of teeth, and you will have the breadth of each tooth, as well as the breadth of each ſpace between them, and this ſame breadth is the thickneſs of the cutter with which the teeth are to be cut. Suppoſe for example, in the wheel above-mentioned, of ſix inches diameter, you are to have 240 teeth, what will be the thickneſs of the cutter for cutting thoſe teeth? Twice 240 is 480; and $\frac{1}{4}\frac{3}{8}\frac{}{0}$ inch gives $\frac{3}{8}\frac{}{0}$ of an inch for the breadth of each tooth as well as of each ſpace, and for the thickneſs of your cutter. This, notwithſtanding, I have found by repeated operations, that $\frac{3}{9}\frac{}{0}$ or $\frac{1}{3}\frac{}{0}$ will anſwer better than $\frac{3}{8}\frac{}{0}$. For that, beſides its coming out in rounder numbers, ſeems to be founded in the very nature of things, ſince the teeth grow narrower towards the centre, than they are towards the circumference; and ſuch an allowance is always indiſpenſably to be made in wheels of ſmall diameters, wherein the length of the teeth is very conſiderable in reſpect of the length

of the diameters. Taking therefore this $\frac{1}{30}$ along with us, and ſuppoſing farther every inch to be divided into forty parts, if the diameter of a wheel be 6 inches, or 240 of ſuch diviſions, and the number of its teeth 240, we ſhall have for the breadth of a tooth or ſpace, and for the thickneſs of a cutter to cut it with, $\frac{3}{2}$ or $1\frac{1}{2}$ of thoſe fortieth parts of an inch, or $\frac{1}{30}$ of an inch as before. After the ſame manner the thickneſs of a cutter for a wheel of any diameter, and any number of teeth, may be calculated: for inſtance, if the diameter of a wheel be 38 of thoſe fortieth parts, and the number of teeth 66, the thickneſs of the cutter will be $\frac{3}{2}$, $\frac{38}{66}$, or $\frac{38}{66} \times \frac{3}{2}$ of thoſe fortieth parts of an inch; or again, $\frac{38}{66} \times \frac{1}{30}$ of an inch. But alſo the thickneſs of a cutter may be immediately deduced from the firſt cutter, viz. from that which ſerved for a wheel of ſix inches diameter, with 240 teeth in it; for the breadths of the teeth, as well as the thicknefſes of the cutters, are *directly* as the circumferences or

diameters

diameters of the wheels, and *inverſely* as the numbers of the teeth. You need only therefore multiply $\frac{1}{30}$ of an inch by the diameter of a wheel, and divide the product by the number of teeth. Thus, in the wheel immediately preceding, the thickneſs of the cutter is $\frac{1}{30} \times \frac{38}{60}$.

In order to exhibit the thickneſs of a cutter accurately, for all ſorts of wheels uſed in watch and clock-making, I have calculated tables, and invented a gauging inſtrument. The inſtrument is a ſector of a circle, on the arch of which there are laid down ſix inches, each divided into forty equal parts;* and it has two indexes, one from the centre of motion to the circumference, the other from the ſame centre to a moveable piece of ſteel which reaches to the gauge.

Theſe indexes are to one another as $11\frac{1}{4}$ inches to $\frac{1}{2}$ an inch, or as 45 to 2, and

 therefore

* Since then the ſix inches are expanded here on an arch, inſtead of being laid down in a ſtrait line, they occupy leſs ſpace, which furniſhes us with an additional reaſon why $\frac{1}{30}$ or $\frac{3}{50}$ of an inch ſhould be taken rather than $\frac{3}{80}$.

therefore, as $\frac{3}{4}$ to $\frac{1}{30}$. So that, whilſt the ſhorter index moves $\frac{1}{30}$ of an inch, the longer will in the ſame time move $\frac{3}{4}$ or $\frac{30}{40}$ of an inch, *i. e.* 30 of thoſe diviſions, 40 of which every inch on the arch is divided into. And, converſely, whilſt the longer index moves $\frac{30}{40}$ of an inch, the ſhorter will move $\frac{1}{30}$ of the ſame; and will therefore exhibit in the gauge $\frac{1}{30}$ of an inch for the thickneſs of a cutter to cut 240 teeth, in a wheel of ſix inches diameter. And the ſame holds good for a cutter of any other thickneſs.

Now the tables calculated by me are accommodated to the longer index of this gauging inſtrument; ſince, whatever thickneſs of a cutter is ſhewn from the tables by the longer index, the true thickneſs of it is $\frac{2}{45}$ of the former, and is ſhewn on the gauge by the ſhorter index. For this reaſon, in the wheel before-mentioned (of 6 inches or 240 diviſions in the diameter, with 240 teeth in it), I aſſume the thickneſs of the cutter, not $\frac{1}{30}$ of an inch, but

30

30 of thoſe fortieth diviſions; and from that wheel, as a ſtandard, I deduce all other wheels, *e. g.* a wheel of 38 diviſions in diameter with 66 teeth in it; wherein the number of diviſions in the diameter of the wheel, viz. 38, I multiply by the *conſtant number* 30, and divide the product by the number of teeth in the wheel, viz. by 66; and the quotient $30\times\frac{38}{66}=17.273$ is the thickneſs of the cutter required, as ſhewn on the arch of the ſector by the long index. And this is the rule by which the tables have been calculated, and which is manifeſt from what has been ſaid above.

I ſhall only add a few words concerning the uſe of the tables and the inſtrument. A wheel of any diameter, with any number of teeth being given, I look in the tables for the thickneſs of the cutter proper for that wheel. Having found it, I bring the longer index of the inſtrument to that number; and at the ſame time the gauge (by means of the ſhorter index) exhibits to me the true thickneſs of that cutter between the two pieces of ſteel.

Thus

Thus much, my Lord, I lay before your Grace, as Preſident of a Society which has ſo well deſerved of the Arts and of Great Britain. If I meet your and their approbation, which is all the encouragement I aim at, I may lay before your Grace many other inſtruments and machines, with their deſcription and uſes, which, at the ſame time that they greatly ſhorten and ſimplify the buſineſs of watch and clock-making, render the execution of their ſeveral parts more accurate.

I have the honour to ſubſcribe myſelf,

My Lord,

Your Grace's

Moſt obedient

and moſt humble ſervant,

Robert Hynam.

St. Peterſburg,
Sept. 2d, 1795.

His Grace the Duke of Norfolk.

The

The number of calculations in this work (beginning with $\frac{1}{8}$ of an inch diameter, increaſing $\frac{1}{40}$ of an inch, and ending with ſix inches diameter) conſiſt of twenty-three thouſand five hundred and upwards. In the courſe of the work ſeveral numbers have no decimals affixed to them. This is when the diviſor is not quite contained in the dividend, and the quotient is only approximate. Thus, ſuppoſe a quotient ſhould be 31.99765, as I put but two places of decimals in the tables, I write 32.00, or if any quotient ſhould be 33.5294, making an allowance for the figure 9. In the third place, I write 33.53, and my error in this caſe is but 0.0005, *i. e.* but $\frac{1}{2}$ of a thouſandth part of unity.

Annexed

Annexed is a Table of Proportions.

I have begun with the leaſt Diameter, introduced two intermediate ones, and the greateſt Diameter.

TABLE OF PROPORTIONS.

No. of Teeth	Thickneſs of Cutter.	No. of Teeth	Thickneſs of Cutter.	No. of Teeth	Thickneſs of Cutter.	No. of Teeth	Thickneſs of Cutter.
5 *Diviſions*		40 *Diviſions*				67	17.91
10	15	30	40	48	25	68	17.65
11	13.64	31	38.71	49	24.49	69	17.39
12	12. 5	32	37. 5	50	24.	70	17.14
13	11.54	33	36.36	51	23.53	71	16.90
14	10.71	34	35.29	52	23.08	72	16.67
15	10.	35	34.29	53	22.64	73	16.44
16	9.38	36	33.33	54	22.22	74	16.22
17	8.32	37	32.43	55	21.82	75	16.
18	8.33	38	31.58	56	21.43	76	15.79
19	7.89	39	30.77	57	21.05	77	15.58
20	7. 5	40	30.	58	20.69	78	15.38
21	7.14	41	29.27	59	20.34	79	15.19
22	6.82	42	28.57	60	20.	80	15.
23	6.52	43	27.91	61	19.67	81	14.81
24	6.25	44	27.27	62	19.35	82	14.63
25	6.	45	26.67	63	19.05	83	14.46
26	5.77	46	26.09	64	18.75	84	14.29
		47	25.53	65	18.46	85	14.12
				66	18.18	86	13.95

No. of Teeth	Thickneſs of Cutter.
87	13.79
88	13.64
89	13.48
90	13.33
91	13.19
92	13.04
93	12.90
94	12.77
95	12.63
96	12. 5
97	12.37
98	12.24
99	12.12
100	12.
112	*Diviſions*
50	67. 2
51	65.88
52	64.62
53	63.40
54	62.22
55	61.09
56	60.
57	58.95
58	57.93
59	56.95
60	56.
61	55.08
62	54.19
63	53.33
64	52. 5
65	51.69
66	50.91
67	50.15
68	49.41
69	48.70
70	48.
71	47.32
72	46.67
73	46.03
74	45.41
75	44. 8
76	44.21
77	43.64
78	43.08
79	42.53
80	42.
81	41.48
82	40.98
83	40.48
84	40
85	39.53
86	39.07
87	38.62
88	38.18
89	37.73
90	37.33
91	36.92
92	36.52
93	36.13
94	35.74
95	35.37
96	35.
97	34.64
98	34.29
99	33.94
100	33. 6
101	33.27
102	32.94
103	33.62
104	32.31
105	32.
106	31.70
107	31.40
108	31.11
109	30.83
110	30.55
111	30.27
112	30.
113	29.73
114	29.47
115	29 22
116	28.97
117	28.72
118	28.47
119	28.24
120	28.
121	27.77
122	27.54
123	27.32
124	27.10
125	26.88
126	26.67
127	26.46
128	26.25
129	26.05
130	25.85
131	25.65
132	25.45
133	25.26
134	25.07
135	24.89
136	24.71
137	24.53
138	24.35
139	24.17
140	24.
240	*Diviſions*
74	97.30
75	96.
76	94.74
77	93.51
78	92.31
79	91.14
80	90.
81	88.89
82	87.81
83	86.75
84	85.71
85	84.71
86	83.72
87	82.76
88	81.82
89	80.90
90	80.
91	79.12
92	78.26
93	77.42
94	76.60
95	75.79
96	75.
97	74.23
98	73.47
99	72.73
100	72
101	71.29
102	70.59
103	69.90
104	69.23
105	68.57
106	67.92
107	67.29
108	66.67
109	66.06
110	65.45
111	64.86
112	64.29
113	63.72
114	63.16
115	62.61
116	62.07

No. of Teeth	Thickneſs of Cutter.	No. of Teeth	Thickneſs of Cutter.	No. of Teeth	Thickneſs of Cutter.	No. of Teeth	Thickneſs of Cutter.
117	61.54	156	46.15	195	36.92	234	30.77
118	61.02	157	45.86	196	36.73	235	30.64
119	60.50	158	45.57	197	36.55	236	30.51
120	60.	159	45.28	198	36.36	237	30.38
121	59.50	160	45.	199	36.18	238	30.25
122	59.02	161	44.72	200	36.	239	30.13
123	58.54	162	44.44	201	35.82	240	30.
124	58.06	163	44.17	202	35.64		
125	57. 6	164	43.90	203	35.47		
126	57.14	165	43.64	204	35.29		
127	56.69	166	43.37	205	35.12		
128	56.25	167	43.11	206	34.95		
129	55.81	168	42.86	207	34.78		
130	55.38	169	42.60	208	34.62		
131	54.96	170	42.35	209	34.45		
132	54.55	171	42.11	210	34.29		
133	54.14	172	41.86	211	34.12		
134	53.73	173	41.62	212	33.96		
135	53.33	174	41.38	213	33.80		
136	52.94	175	41.14	214	33.64		
137	52.55	176	40.91	215	33.49		
138	52.17	177	40.68	216	33.33		
139	51.80	178	40.45	217	33.18		
140	51.43	179	40.22	218	33.03		
141	51.06	180	40.	219	32.88		
142	50.70	181	39.78	220	32.73		
143	50.35	182	39.56	221	32.58		
144	50.	183	39.34	222	32.43		
145	49.66	184	39.13	223	32.29		
146	49.32	185	38.92	224	32.14		
147	48.98	186	38.71	225	32.		
148	48.65	187	38.50	226	31.86		
149	48.32	188	38.30	227	31.72		
150	48.	189	38.10	228	31.58		
151	47.68	190	37.89	229	31.44		
152	47.37	191	37.70	230	31.30		
153	47.06	192	37. 5	231	31.17		
154	46.75	193	37.31	232	31.03		
155	46.45	194	37.11	233	30.90		

SIR,

SIR,

STIMULATED by the mark of honour conferred upon me by the Society, I reviewed the work I had preſented to them, and happily fell on a method of calculating the tables with more eaſe, much ſhorter, and leſs liable to error. This encourages me (if it meets the Society's approbation) to make the gauging inſtrument more univerſal, without altering its conſtruction in the ſmalleſt degree. I mean only to extend the arch upon the inſtrument ſix inches more than it is at preſent, and to divide one of its edges into 12 inches, and each into 40 equal parts*. By this ſmall addition, the

* A ſcale, laid down on an arch of a circle whoſe radius is only $11\frac{1}{4}$ inches, ſhould not be uſed in gauging wheels of large diameters. Such wheels ſhould have their diameters gauged by a ſtrait line divided into inches, and each inch into forty equal parts: for in large wheels the length of the teeth bear a ſmall proportion to the diameters; but in wheels of ſmall diameters the length of the teeth is very conſiderable in reſpect to the length of the diameters, as I have before obſerved.

the thickneſs of cutters for cutting wheels may be accurately determined from $\frac{1}{8}$ of an inch to two feet diameter, in which may be cut from 8 teeth to 2000 and upwards; a number, I believe, never uſed in practice. The inſtrument not admitting a ſcale to be laid down more than 12 inches in length, therefore, when a diameter exceeds that length, the radius taken and doubled gives the diameter.

As the following rule is very ſimple and eaſily underſtood, I think it renders the continuation of the tables unneceſſary. A few examples may ſuffice, more eſpecially as the number of wheels uſed of a larger diameter than ſix inches bears a ſmall proportion to thoſe wheels uſed of a leſs diameter.

Rule.

Divide the conſtant number 30 by the number of teeth in the wheel, and multiply the quotient by the number of diviſions contained in its diameter, and the product will

will be the thickneſs of the cutter. And by adding the thickneſs of the cutter found to the quotient, you have the thickneſs of another cutter for a wheel which contains one diviſion more in diameter; for, as long as the number of teeth in the wheel continues the ſame, whatever are the number of diviſions in the diameter of the wheel, there is only one calculation to be made; all the other thickneſſes are found by *addition only*.

Explanation.

Suppoſe the number of teeth in the wheel is 240, and the diviſions in the diameter 241. Divide 30, the conſtant number, by 240, and the quotient will be 125. Multiply this quotient 125 by 241, the diviſions in the diameter of the wheel, and the product will be 30.125, the thickneſs of the cutter in this caſe. Now, if the diviſions in the diameter of the wheel are 242, and the number of teeth in the wheel 240,

add 125 the quotient, and 30.125 the thickneſs of the cutter juſt found, and the ſum of 30.250 will be the thickneſs of a cutter for a wheel having 242 diviſions in diameter, and 240 teeth. Again, if the diviſions in the diameter of the wheel are 243, and the number of teeth in the wheel 240, add 125 and 30.250, and the ſum 30.375 will be the thickneſs of a cutter for 243 diviſions in diameter, as may be farther ſeen by the following ſtatement, and may be compared by the tables ſent.

Diviſion in Diam. ,83333 Quotient

Teeth $\frac{30}{36}$ =,83333,83333 ×60=49,99980 *Thickneſs of cutter.*

61=50,83313
62=51,66646
63=52,49979
64=53,33312
65=54,16645
66=54,99978
67=55,83311
68=56,66644

Place

Place the quotient over the thickneſs of the cutter 49.99980; add them together for another thickneſs of cutter for a wheel having one more diviſion in diameter, viz. 61, and ſo proceed with 62, 63, 64, &c. &c. The teeth in the wheel to remain the ſame number 36. But to avoid intermediate numbers, the teeth in the wheel remaining the ſame, and the diameter of the wheel increaſing to any number of diviſions, you have only to multiply the quotient found by the number of diviſions in the new diameter, and you will have the thickneſs of the cutter. If the diameter of the wheel ſhould be leſs, proceed as above.

Examples wherein the Teeth and Diameters differ.

Teeth	W.D.	Thickneſs Cutter.	W.D.	Thickneſs Cutter.
	$\frac{30}{250}\times 295 = 35,40$		$\frac{30}{425}\times 566 = 39,95$	
	$\frac{30}{275}\times 292 = 31,85$		$\frac{30}{600}\times 720 = 36$	
	$\frac{30}{300}\times 250 = 25$		$\frac{30}{1000}\times 480 = 14,40$	
	$\frac{30}{336}\times 298 = 35,52$		$\frac{30}{1000}\times 960 = 28,80$	
	$\frac{30}{380}\times 560 = 44,25$		$\frac{30}{2000}\times 960 = 14,40$	

The foregoing numbers $\frac{3}{3}\frac{2}{8}$ ſhould have but two places of decimals agreeably to the tables: then they would be,

Thickneſs of Cutter.

50,
50,83
51,67
52,5
53,33
54,17
55,
55,83
56,67

I am, SIR,

Your moſt obedient humble ſervant,

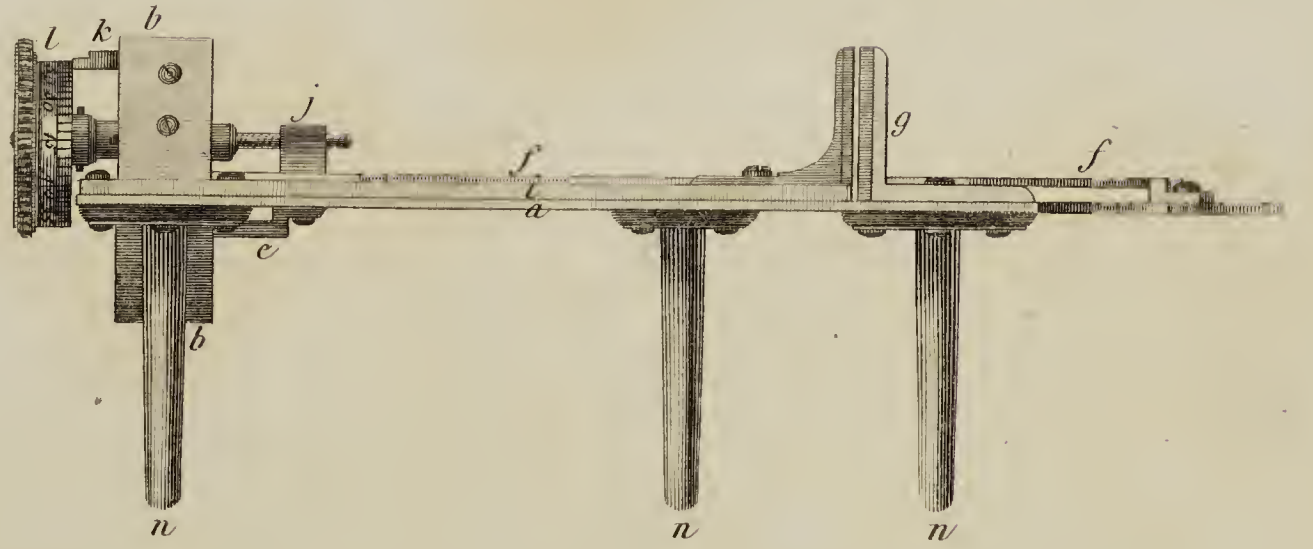
ROBERT HYNAM.

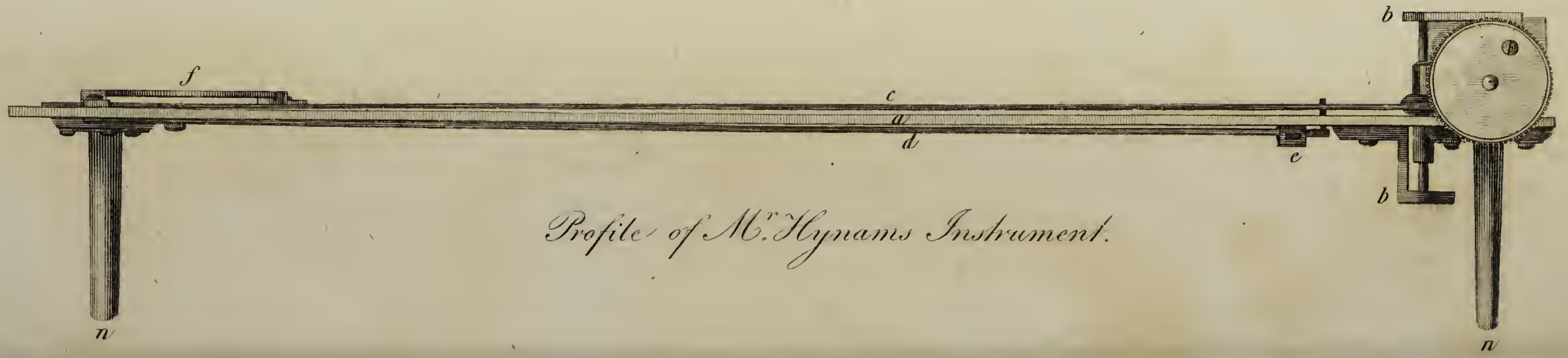
St. Peterſburgh, Jan. 20, 1797.

Mr. MORE.

Deſcription

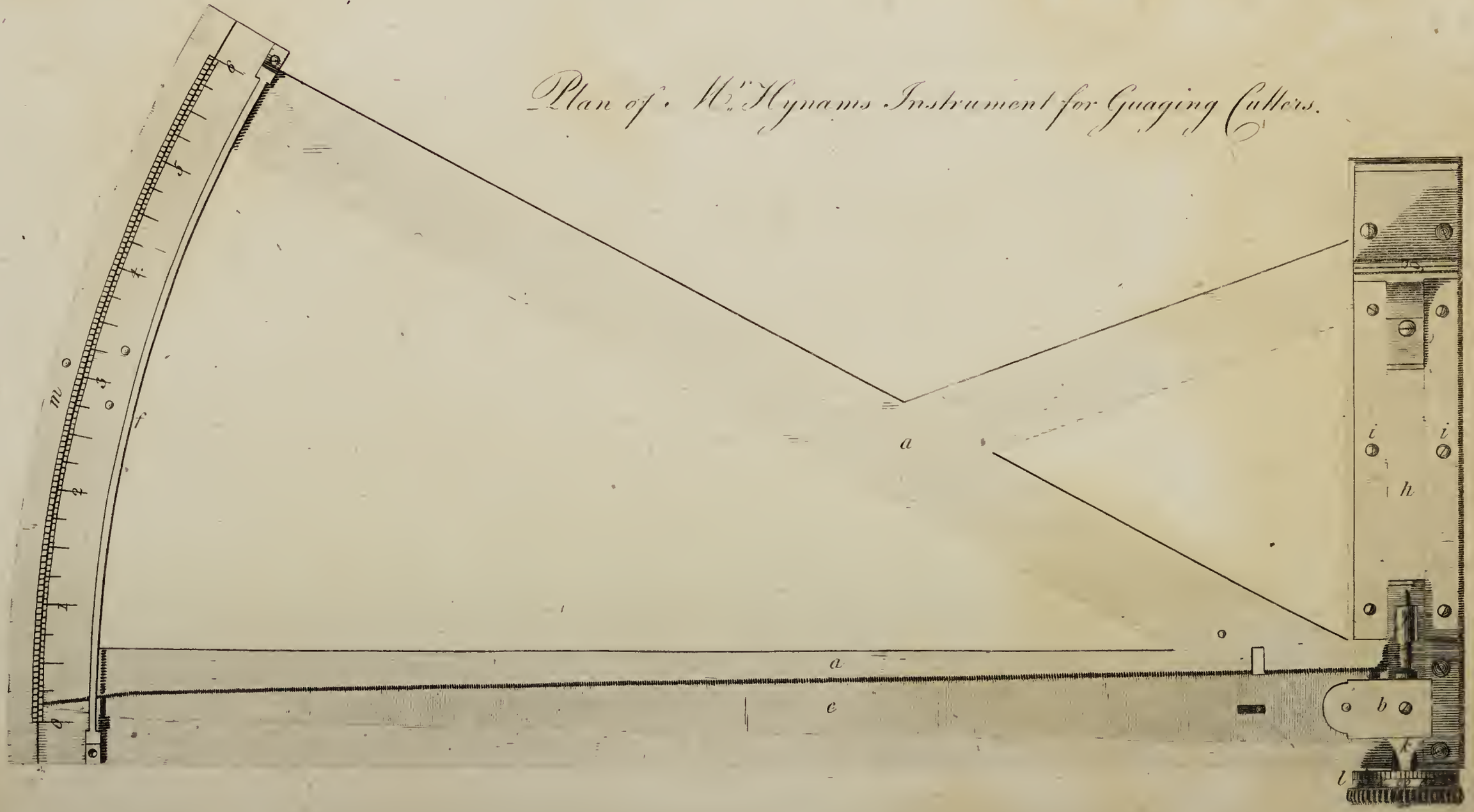
End View of Mr. Hynams Instrument.





Profile of Mr. Hynams Instrument.

Plan of Mr. Hymans Instrument for Guaging Cutters.



Deſcription of Mr. HYNAM'S *Inſtrument for* GAUGING CUTTERS. *Plate I.*

a. The baſe on which all the work is fixed.

b. One of the cocks, there being two, which the index moves in, but the under one cannot be ſeen in the plate of the Plan.

c. The index, having under it a ſpring *d.* as ſhewn in Plate II.

f. A bridge over the point of the index.

g. A fixed cock to the baſe, with ſteel chop.

h. A dovetail: on one end is fixed a cock having a ſteel chop, which forms the gauge with *g.*

i. The ſides in which the dovetail moves.

j. A ſteel ſtud, tapped and fixed to the dovetail.

k. A cock fixed to the inſide of the cock *b.* through which paſſes the adjuſting ſcrew to the ſteel ſtud *j.*

l. The divided nut upon the adjuſting ſcrew.

m. A ſegment of a circle, divided into ſix parts in the Plan, each part containing forty diviſions, and being, on the Inſtrument at large, twelve inches in length.

The letters of reference to the ſeveral parts are the ſame in Plate II. as in Plate I. excepting that in Plate II. the two cocks marked *b*. and the bridge of the ſpring *d*. are ſhewn, which cannot be ſeen in Plate I.

n. The feet of the inſtrument.

A Bounty of SIXTY-FIVE POUNDS was this Seſſion voted to Mr. SIMON GOODRICH, for the application of a CRANK to anſwer the purpoſes of an Eſcapement in Clocks; of which a Deſcription and Print are hereunto annexed, and the Clock itſelf reſerved in the Society's Repoſitory, for the inſpection of the Public.

SIR,

I BEG leave to preſent to the Society for the Encouragement of Arts, Manufactures, and Commerce, for their inſpection, a Clock with the ſimple application of a Crank, as an eſcapement, to give motion to the pendulum.

The Clock does not appear in ſo ſimple a ſtate as it might, had the train been made on purpoſe for the invention, with all the wheels, and fewer of them in number, placed between the two plates, with the crank only behind the back plate: but I

was induced to apply the motion to a ready-made clock, in order to try, by the ſame machine, a point of which I had ſome doubts; namely, that perhaps, on account of the greater velocity of the acting part, this method might require more power than the common. The experiment proved in favour of the crank; though, with the common eſcapement well adjuſted, I kept the pendulum in motion for ſome days, with as ſmall a power as I could with the crank; yet the ſame ſmall power with the common eſcapement was not ſufficient to maintain the motion ſo long as it was with this crank. The weight here uſed for this eight-day piece, which has kept it going for about ſix months without once failing, is $4\frac{1}{2}$ lb. It has in it an allowance of more than half for the loſs of power from foulneſs or other accidents; for 2 lb. was ſufficient to work the clock for ſeveral weeks, when firſt put together.

That I may be enabled to refer to ſome particulars in this letter, I have incloſed a

ſketch

ſketch and deſcription of this invention. See the Plate.

The advantages of this Eſcapement are, firſt, ſimplicity of conſtruction, conſequently cheapneſs. It can eaſily be adopted by the manufacturers of the common wooden Dutch clocks, as the whole eſcapement can be formed of a few pieces of wire bent till properly adjuſted, without even the neceſſity of the adjuſting ſcrews I I. Therefore the benefits of this invention may extend even to the poorer part of the public.

2dly, Total ſilence when going; clocks being excluded by many perſons, to whom and from many places where uſeful, upon account of their noiſe.

3dly, Keeping good time, ariſing from this principle, that the crank always impels the pendulum in the ſame manner; that is, as it paſſes through the ſemicircle under its centre, always one way; and as it paſſes through the ſemicircle over its centre, always the other way; and it recurs in the ſame ſituation it ſet out from, after theſe

two

two impulſes, which being eaſily made equal by means of the adjuſting ſcrews, notwithſtanding the ſmall difference in length of the levers acted upon, all the ſucceeding impulſes muſt alſo correſpond with theſe, and be equal and regular, as far as regards the eſcapement itſelf. In other eſcapements, if any irregularity exiſts or is worn in any one or more of the teeth or pins in the ſcape-wheel, and the pallets or inclined planes they act againſt, the impulſes given to the pendulum cannot be equal and regular; and the higher the number of the ſcape-wheel, the greater this chance of imperfection.

4thly, Durability and great certainty of continuance. This Eſcapement does not require oil, which, as it becomes clammy and thick by the duſt, is the frequent and well-known cauſe of the ſtopping of others; it does not wear itſelf untrue and out of order. The friction of the collets upon the crank muſt be very ſmall, as the acting ſurface is ſmall, and as the intenſity of the impulſe upon the pendulum is in

proportion

proportion leſs in this, as it acts upon a longer lever than in others; alſo at the time that the chief force is exerted, as the crank paſſes over and under its centre, there is very little turning of the collets upon it: ſo that I judge this Eſcapement, properly made, ſtands a fair chance of laſting as long as the train itſelf without being out of order; which I underſtand is far from being the caſe with others.

The ingenious part of the Public can no doubt improve upon this application. Of the various methods I have tried, this appears to me the beſt for general uſe. I can ſend the Society drawings* of two other methods which I have tried, if by this they ſhould judge them worthy their notice. In the one, the crank, beſides its own, can be applied with all the advantages of a dead beat, and in the other of a detached eſcapement; but they will not have the advantage of ſilence.

I do

* The drawings here alluded to, as alſo a model of another Eſcapement, by Mr. Goodrich, are reſerved in the Society's collection.

I do not mean to ſecure this invention to myſelf by a patent: my intention, in preſenting it to the Society, is for the benefit of the Public, hoping at the ſame time, that if the Society find any merit in it, their bounty will be an encouragement to exertion in future, and at preſent ſome recompence for my expence and time; as my family and ſelf, which I have to maintain out of no more than journeyman's wages, do not permit me to undertake any thing of this kind without a proſpect of indemnification.

I can truly affirm this is my own invention; and if, in deſcribing it, I have miſſtated any thing, I hope the fault will be attributed to my want of judgement, and not to my intention.

I remain, SIR,

Your moſt obedient ſervant,

SIMON GOODRICH.

No. 3, *Canterbury Walk, Lambeth.*
Feb. 12, 1799.

Mr. MORE.

Fig. 1.

Fig. 1.

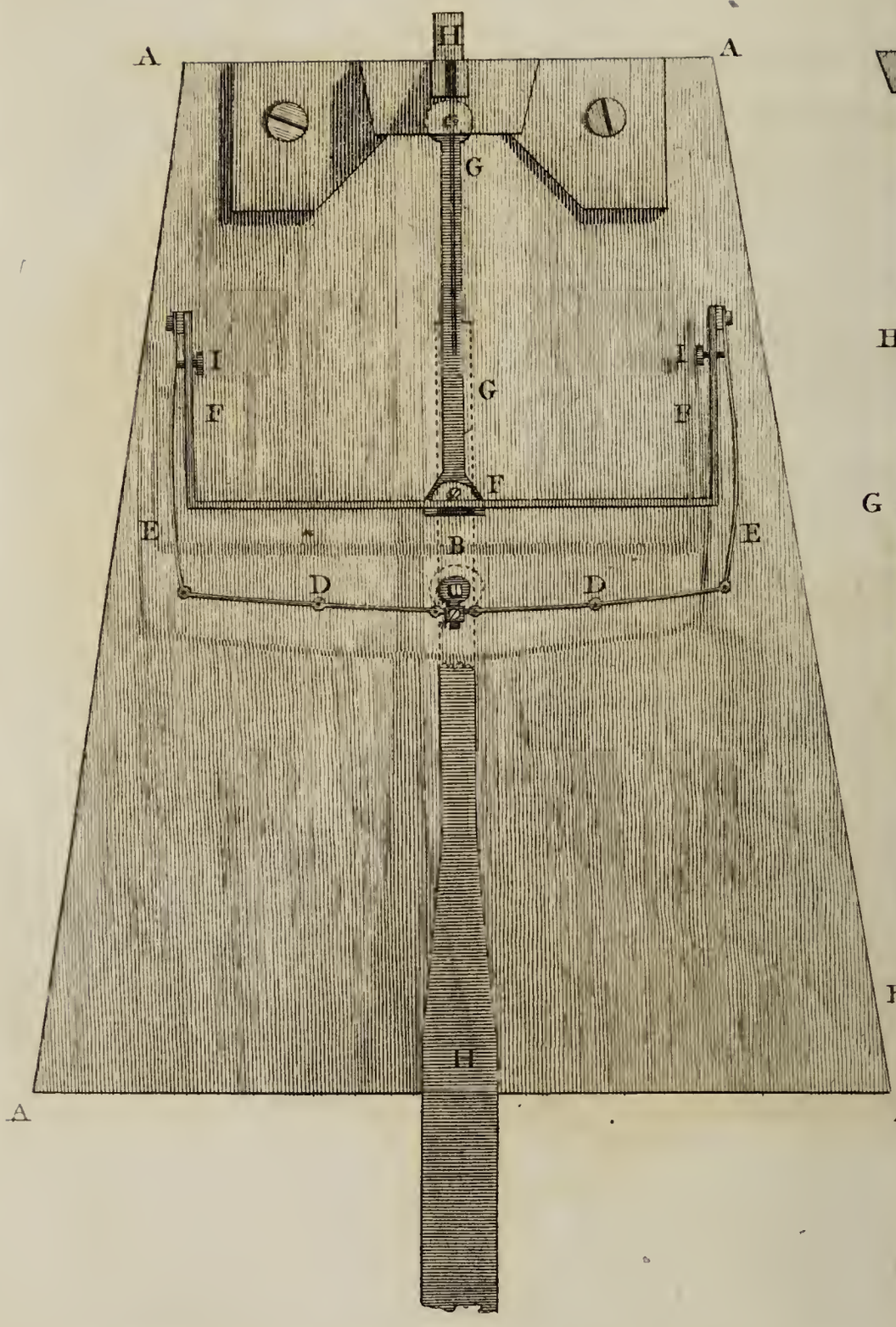
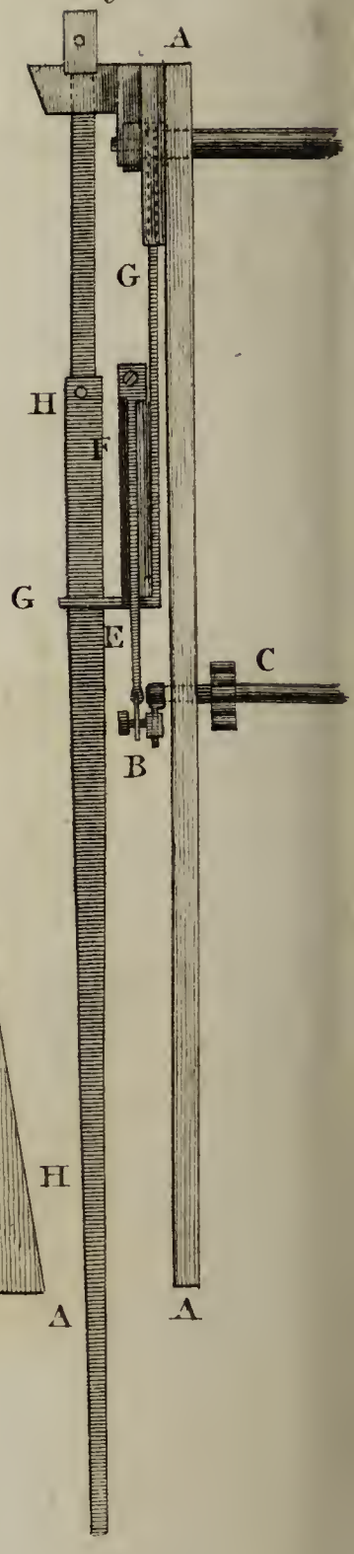


Fig. 2.



Mr. Simon Goodrich's Application of a Crank to answer the purposes of an Escapement in Clocks.

Fig. 1. A front view of the Crank Eſcapement.

Fig. 2. A ſide view of ditto.

The ſame letters of reference are put to the correſponding parts in each figure.

A A A A. The back plate of a Clock.

B. The crank fixed on the end of

C. The arbor of the laſt pinion of the train.

D D. Two ſmall wire chains, compoſed of two links only, attached to the crank B by means of two collets, with plenty of liberty upon it. Theſe chains are faſtened to

E E. Two ſmall ſprings ſcrewed to

F F F. A bar that goes acroſs, and is faſtened in the middle to

G G. The crutch, with which

H H. The pendulum is ſuſpended in the common way.

I I. Are two ſcrews going through the bar F, the ends of which being made to act againſt

againſt the ſprings E E, ſerve to adjuſt them to a proper diſtance and degree of ſtrength, and by that means eaſily to put the pendulum in proper beat.

In *Fig.* 1. the pendulum is partly repreſented by dotted lines, in order to ſhew the crank, &c.

In

In conſequence of ſome trials made of a Method of TURNING SPHERICAL FORMS IN WOOD in a more expeditious Manner than uſually practiſed (a Deſcription of which Method is hereunto annexed), the Society this Seſſion voted a Bounty of TWENTY GUINEAS to Mr. THOMAS COOK, of Newington, Surrey; and ſeveral Samples ſo turned by him are reſerved in the Society's Collection, for the inſpection and information of the Public.

SIR,

HEREWITH you receive the method of preparing and turning a true round or ſpherical figure, between two centres, principally upon a large ſcale, by means of the large wheel commonly made uſe of by turners.

Prepare of wood as near a cube as may be; plane one ſide true, and gauge a line down

down the middle, from which line the centres are at each end found with a pair of compaſſes. Then form the piece to an octagon, by taking off the four corners; place it in the lathe, and lay the band on about one third from the end; then ſtrike each end to the exact length of the intended diameter. With a pair of compaſſes divide the piece which gives the centre or curve line, and biſects the gauge ſtroke; ſtrike it with a chiſſel, then with a ſmall gouge which makes a groove for the band to work in (taking care not to diminiſh the ſize of the diameter); from the middle work down each end with a gouge to as fair a round as you can by eye, or with the callipers: then take the piece out, and carefully prick the ſecond centres, which the gauge ſtroke and curve line give: place in the lathe the laſt pricked centres, and paſs the piece round by hand: work down with a ſmall firming chiſſel, in order to form a ſecond curve line, until it biſects the firſt diameter or curve line: then ſtrike the piece to the firſt

centres

centers, and work off the remaining wood with a large firming chiſſel, until it becomes fluſh with the ſecond curve line: it may then be poliſhed. Throw off the band, and turn round the ball by hand to work off the groove the band played in. Should you not think fit to paſs the ball by hand, ſhift your reſt to the oppoſite ſide, and have the wheel turn the reverſe way; by this means you turn off the groove. To poliſh the remainder, the band will play on the ſurface of the ball, by being ſteadied with the hand.

I remain reſpectfully,

Your moſt obedient humble ſervant,

THOMAS COOK.

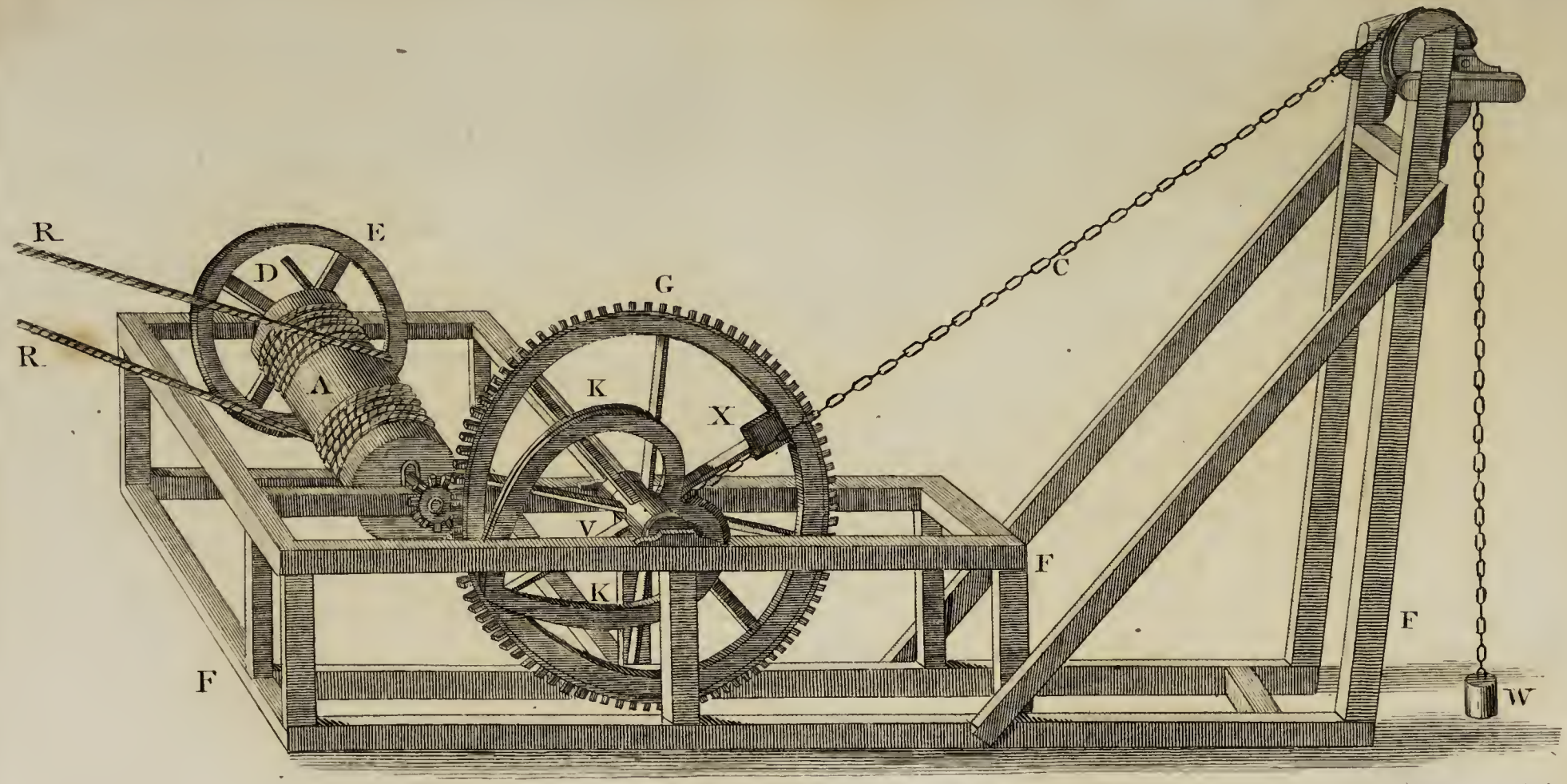
Newington, May 27, 1799.

Mr. MORE.

The Thanks of the Society, and the SILVER MEDAL, were this Seſſion voted to Mr. WILLIAM FEATHERSTONHAUGH, for the following Deſcription and Drawing, accompanied with a Model of a Machine invented by him for COUNTERBALANCING THE ROPES uſed in the DEEP SHAFTS OF MINES; which Model is reſerved in the Society's Repoſitory.

SIR,

THE beginning of laſt year I conſtructed a model of a counterbalance, for preſerving a conſtant equilibrium between the ropes uſed in machinery, wrought by ſteam engines or otherwiſe, for the purpoſe of raiſing coals, upon a plan which I had never ſeen or heard before, which I ſhewed to the proprietors of ſome extenſive coal-mines in this neighbourhood, who immediately got a large one conſtructed, which they



Mr. Featherstonhaugh's Counterballance, for Ropes in deep Mines.

they continue to uſe and prefer to any of the other counterbalances erected in this country. A model of the above counterbalance I now beg leave to ſubmit to the inſpection of the Society, and ſhall be extremely glad if it appears to them of ſufficient utility to merit a deſcription in their tranſactions.

I am, SIR,

Your moſt obedient ſervant.

WM. FEATHERSTONHAUGH.

Lambton, near Cheſter-le-ſtreet,
Durham, April 14, 1798.

Mr. MORE.

SIR,

YOU will pleaſe to lay before the Society for the Encouragement of Arts, Manufactures, and Commerce, the following account of the advantage which I conceive

the counterbalance erected by me to have over thoſe already in uſe; with its dimenſions, &c. The beſt mode that I have ſeen adopted may be thus deſcribed. A chain is faſtened to the axis of the rope-barrel, which, paſſing over a pulley, deſcends into a pit, and is there faſtened to the end of a very heavy chain. When the ropes are in equilibrio, the large chain is at the bottom of the pit; but as the difference of their weights increaſes, the ſmall chain, winding upon the axis of the rope-barrel, lifts up the large one from the bottom of the pit, till it is ſuſpended at full length, at which time one corf has aſcended to the top of the ſhaft. One diſadvantage attending this counterbalance is the depth of the pit for the chain to deſcend into. I meaſured the depth at a machine, upon a colliery belonging to Sir Henry Tempeſt Vane, Bart. and found it to be fourteen fathoms, meaſured from the axis f the pulley to the bottom; the depth of the ſhaft being eighty-eight and a half fathoms.

At Heaton colliery, near Newcaſtle-upon-Tyne, the owners thereof expended near two hundred pounds, in attempting to ſink a pit for the counterbalance chain, but which they could not get ſunk deeper than three and a half fathoms, on account of water; they therefore fixed the pulley five fathoms from the top of the pit, making the whole length of ſpace for the chain to move in, eight and a half fathoms. They have lined the pit near the bottom with metal plates, to prevent the chain wearing away the ſides. I think the chain muſt ſuffer much by friction. The counterbalance which I erected is ſtill uſed at a coal-pit in Harraton colliery, ſituated about two miles from Cheſter-le-ſtreet, and belonging to the truſtees of the late William Henry Lambton, Eſq. The depth of the pit for the counterbalance is five fathoms, meaſured from the axis of the pulley to the bottom. The weight ſuſpended at the end of the chain is thirty one and a half hundred weight; diameter

of the wheel, fifteen and a half feet; depth of the ſhaft, ſeventy-ſix and a half fathoms; and weight of ſeventy-ſix and a half fathoms of rope, five hundred weight two quarters. Another diſadvantage attending the counterbalance firſt deſcribed is, that it does not regularly take off the weight of the heavier rope, which will appear by conſidering that, immediately after the corves have paſſed each other in the ſhaft, and the difference of the weights of the ropes very ſmall, the leſſer chain is acting very powerfully upon the axis, which is of an equal diameter in each part whereon the chain winds. According to my plan, there is an irregularity occaſioned by the weight of the chain, but it is very trifling. One inconvenience which may poſſibly attend the counterbalance I invented is, that as the engine-men, through inattention, ſometimes draw a corf over the pulley above the ſhaft, the weight at the end of the chain may be drawn too high, and ſome part of the machinery broken; but during a year

and

and a quarter's conſtant uſe of this counterbalance, the engine-man, though he has ſometimes drawn a corf over the pulley, has always been able to ſtop the machine before any accident happened. It would conſiderably diminiſh the friction, to fix the large wheel nearly in a horizontal poſition, with bevel teeth, ſo that its weight might reſt almoſt entirely on one end of the axis. The counterbalance formerly uſed at Harraton colliery is on the following conſtruction. A large wheel, with a weight fixed therein, near to its circumference, is placed directly above a pinion on the end of the rope barrel: when the ropes in the ſhaft balance each other, the weight is at reſt; but the machine being put in motion, the pinion turns the large wheel, and the weight aſcends till it has deſcribed a quadrant of a circle, at which time its power is the greateſt, and one rope has reached the top of the ſhaft. This counterbalance does not act uniformly, and its power is very ſmall. There has been a counterbalance erected at Heaton colliery, about fourteen

or fifteen weeks ago, by Mr. Jeffreys, an engineer, near Newcaſtle-upon-Tyne, on nearly the ſame conſtruction as mine; the principal difference being, that in his the chain hangs directly from the wheel, and the weight moves in a gutter. Mr. Jeffreys ſays, he never had an opportunity of bringing it into uſe before; but was ſhewn a model of it above ſix years ago, by a perſon of the name of Crowther, who I ſuppoſe is employed under him. When I recommended the new counterbalance to be erected at Harraton, the proprietors were uſing the old one deſcribed above, having the large wheel directly over the pinion. They made the improvement without taking down the large wheel; and on account of its being in rather a bad ſtate, they have not much more than one ton weight ſuſpended at the end of the chain.

I am, SIR,

Your moſt obedient ſervant,

WM. FEATHERSTONHAUGH.

Lambton, near Cheſter-le-ſtreet,
November 30th, 1798.

Mr. MORE.

WE the underſigned, being the managers of Lambton, Harraton, Bourn Moor, Lumley, Murton and Penſhaw collieries, and two of the proprietors of the machinery erected thereon for the purpoſe of drawing coals, do certify that we have uſed about fifteen months a counterbalance recommended by Mr. William Featherſtonhaugh. It is the beſt method that has ever been propoſed to us, and we believe it to be his own invention.

T. CROUDACE.

M. FEATHERSTONHAUGH.

THIS is to certify that I conſtructed a counterbalance laſt year for Meſſrs. Featherſtonhaugh, Fenwick, and Croudace, according to a model ſhewn me by Mr. Wm. Featherſtonhaugh. I have endeavoured to compare the expence of a counterbalance on his plan with that of a counterbalance by means of a large chain for the depth of ſeventy-

ſeventy-ſix and a half fathoms, and am of opinion that there will be little difference in the firſt coſt. In caſe there is much water, the latter method will be a great deal more expenſive. I think his counterbalance may be upholden and replaced at new pits, for leſs expence. I believe the invention to be new, as I never heard of it before.

JACOB WEATHERBURN.
Engine-wright.

A Deſcription

A Deſcription of the Plate repreſenting the Counterbalance invented by Mr. WM. FEATHERSTONHAUGH.

F F F Are the different parts of the framing. A ſteam-engine is ſuppoſed to turn the barrel A by means of a crank at the end D. E is a fly wheel. R R are the ropes which deſcend into the mine. When the engine is put in motion, the barrel A revolves, and, by means of a pinion on the end of its axis, turns the wheel G; the chain C, with a weight W at the end, winding upon one of the curves K K, which are formed of pieces of timber ſtrongly faſtened to the arms of the wheel G, and in which grooves are cut to prevent the chain from ſlipping off. The teeth of the wheel and pinion are of caſt iron. A pit muſt be dug for the weight W to deſcend into, but it need only be of a very ſmall depth; whereas, in the beſt counterbalances which I have ſeen, a pit of conſiderable depth is neceſſary, in the ſinking of which, in ſome inſtances, when there has been much water, I have known

known a very large ſum expended. When the wheel G has revolved ſo far that the chain makes a right angle with the arm V, at the extremity thereof; it then acts with its greateſt power, and the difference of the weights of the ropes is the greateſt. The curves K K were attempted to be drawn of ſuch a form, that as the wheel G revolved, a perpendicular let fall from its centre upon the line of direction of the chain might uniformly increaſe; but according to the method in which I have applied the chain, it could not be done perfectly exact. X is a weight to balance the curved pieces of timber on the oppoſite ſide of the wheel. Where there are ſeveral ſtrata of coal in one pit, if a counterbalance be calculated for the deepeſt, it will anſwer for the reſt without alteration. Where the depth is very great, two counterbalances may eaſily be applied; or the power of this counterbalance may be encreaſed by making the ſpiral-ſhaped pieces of timber extend beyond the circumference of the wheel.

The

The Thanks of the Society were this Seſſion voted to Sir THOMAS HANMER, Bart. for the following Account and Drawing of a Method of LAYING ON WATER UPON WATER-WHEELS, as practiſed by him in Flintſhire.

SIR,

THE old method of conveying water from a higher level to an overſhot mill wheel, proving ſo deſtructive to the different timbers and working gear of all mills of this deſcription, by the ſplaſhing and beating of the water overflowing the buckets, its extreme waſte of water, and the retrogade manner in which the water is diſcharged from the bucket cauſing rather a ſtagnation in the water under the wheel, where the fall is not very great; and floods are very apt to dam or tail-back, and thereby impede or clog the regular motion of the wheel; have induced the proprietor to try the following plan hereunto annexed, and which

which has been adopted at an overſhot corn-mill in Flintſhire, with the aſſiſtance of Mr. John Wilkinſon, Iron-maſter, of Birſham Forge, Denbighſhire.

A. The line of high-water level.

B. The iron ciſtern.

C. The valve to the ciſtern.

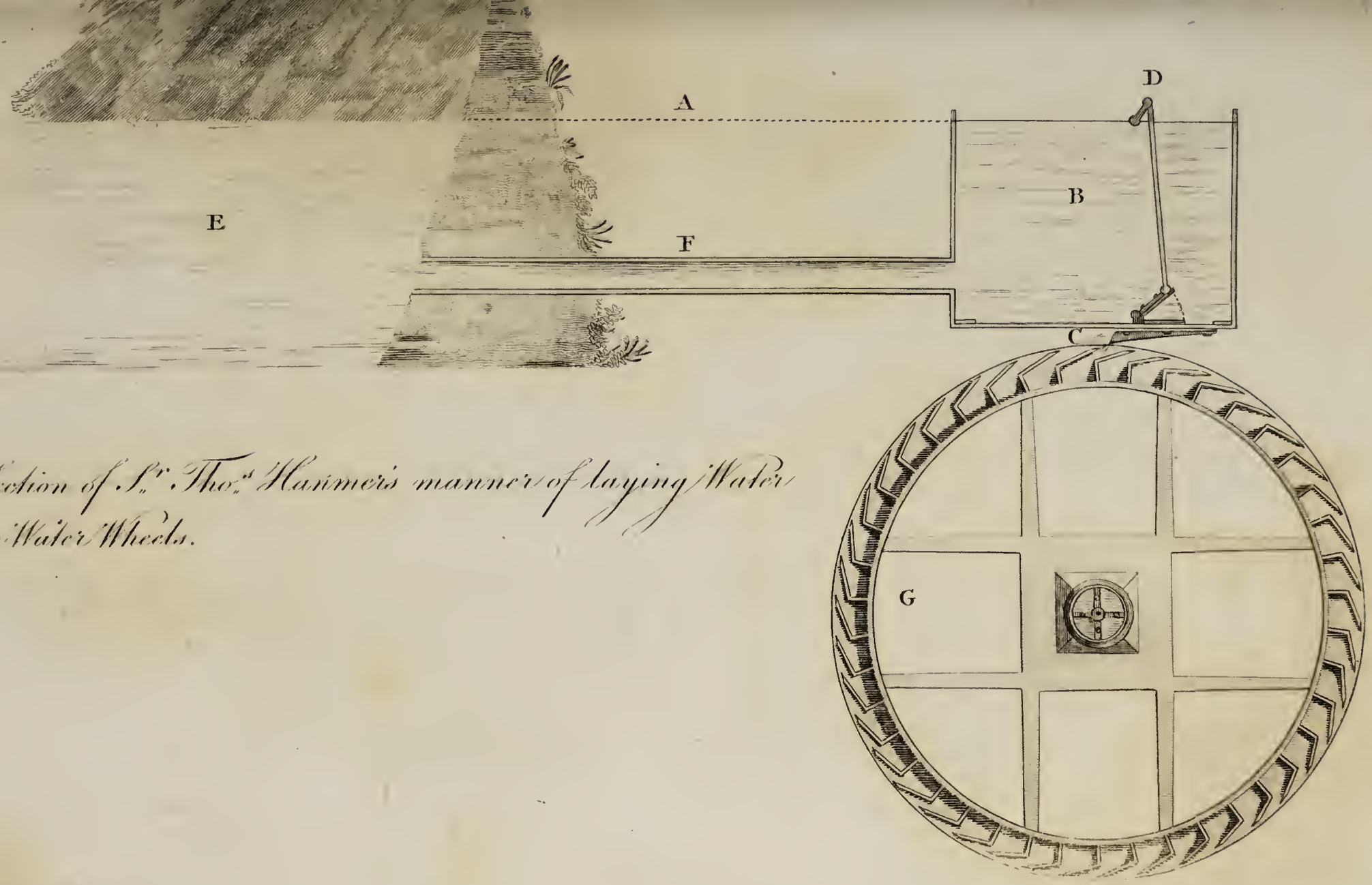
D. The lever that lets the water on the wheel.

E. The pool dam.

F. The iron pipe, through which the water is conveyed from the pool to the ciſtern.

G. The large wheel.

By the delivering the water from a valve in the ciſtern, which is of caſt iron, a little beyond the centre of the wheel, you are able to obtain the motion of an underſhot wheel without the loſs of any water or injury to the mill-work by perpetual ſplaſhing, as by the old method. There is a great ſaving of water by this plan, ſo as to enable the mill to do nearly double the work



Section of S.r Tho.s Hanmer's manner of laying Water on Water Wheels.

work with the ſame ſupply of water, compared with what it did in the old way. The motion is quicker, and the wheel rids itſelf with greater eaſe, and the water paſſes off with great rapidity, and acts with greater power againſt floods and froſts: the whole of the wheel and ciſtern ſhould be covered from the weather: the bore of your pipe may be of any dimenſions, according to your ſupply of water. It was completed at Hanmer in 1797; and from its ſucceſs, the proprietor is induced to give a plan and ſection to the Public, and to lay it before the Society for the Encouragement of Arts, Manufactures, and Commerce, for their information; not doubting, from the ſucceſs he has experienced, that if more frequently adopted, it may admit of conſiderable improvement, and be of great utility.

I am, SIR,

Your obedient ſervant,

THOMAS HANMER, Bart.

Bettisfield Park, May 27, 1798.

Mr. MORE.

PAPER

IN

COLONIES AND TRADE.

COLONIES AND TRADE.

The Society this year received the following Paper and Certificates in claim of the Premium, being the GOLD MEDAL, offered for the cultivation of the BREAD-FRUIT TREES in the Weſt Indies; but the Candidate not having fully complied with the terms ſpecified in the Advertiſement, no Sample of the Fruit having been ſent as required, he could not be conſidered as entitled to the Premium offered; yet in conſideration of his merit, as being the firſt Claimant for this Premium, he was preſented with the SILVER MEDAL and TWENTY GUINEAS.

ARCHIBALD M'LIESH, now in the ſervice of Samuel Mure, Eſq. on Williamsfield Penn, in the pariſh of St. Elizabeth, Iſland of Jamaica, declares that he planted within a ſtrong encloſure, formed of a ſtone wall four feet and a half in height,

which takes in an area of about three acres and a half on the ſaid ſettlement, one hundred and one Bread-Fruit trees; the original plants of which were brought from Otaheite, and put in the ground from the 17th Oct. 1797, and continued to be ſupplied with freſh plants until 1ſt Jan. 1798; the whole of which number of Bread-Fruit plants are now in a moſt thriving and flouriſhing ſtate.

ARCHIBALD M'LIESH.

Williamsfield, Aug. 10, 1798.

I CERTIFY, that I ſaw the above-mentioned plantation of Bread-Fruit trees, and inſpected them with great attention; and that the above declaration, as to the numbers growing in a thriving and flouriſhing ſtate, and the fence by which they are encloſed, is genuine and authentic.

ROBERT BRERETON,
Major-General of Militia, Iſland of Jamaica.

I believe the above to be a fair and juſt ſtatement.

BALCARRAS, Lt. Gov.

Archibald M'Lieſh has diſtributed about three hundred and fifty plants of the Bread-Fruit to gentlemen of eſtates, at the diſtance of forty or fifty miles from him, and has upwards of two hundred more to diſtribute, beſides thoſe mentioned in the certificate.

The method of cultivating the Bread-Fruit Trees is as follows:

By ſuckers and layers; and alſo by cutting off the ſmall roots of one quarter of an inch to one inch and a half diameter, and about five inches in length, from trees that bear fruit, which muſt be planted, the ſmall end downwards, and the thick end about half an inch above the ſoil; and in ten months they may be tranſplanted.

The trees arrive at the greateſt perfection in a rich loamy ſoil, and require great heat and moderate moiſture.

ARCHIBALD M'LIESH.

REWARDS

BESTOWED BY THE

SOCIETY,

From October, 1798,

To June, 1799.

REWARDS

BESTOWED IN

AGRICULTURE.

Class 50. TO THOMAS PAGE, of Ely, Esq. for having planted seven and a half acres with Oziers, in the year 1798, the GOLD MEDAL. See page 140.

Class 88. To Mr. ROBERT DUDGEON, of Tillingham, near Dunbar, for having cultivated upwards of twenty-three acres with Wheat after Beans, in the year 1797, Twenty Guineas. See page 144.

Class 93. To Mr. WILLIAM SEATON, of Tilgate, Sussex, for having cultivated six acres of land with Potatoes, for

for feeding Cattle and Sheep, THIRTY GUINEAS. See page 160.

To JOHN MIDDLETON, of Lambeth, Esq. for various experiments on different kinds of Manure, the SILVER MEDAL. See page 231.

To THOMAS WAKEFIELD, of Liverpool, Esq. for experiments on making Hay in Wet Weather, the SILVER MEDAL. See page 226.

To the Rev. HENRY JEROME DE SALIS, D. D. of Wing, Herts, for observations on the use of Parsneps in feeding Cattle and Sheep, the SILVER MEDAL. See page 256.

Class 90. To MATTHEW FORSTER, of Broomyholme, near Chester-

Cheſter-le-ſtreet, Eſq. for Obſervations on the comparative Culture of Turneps, the GOLD MEDAL. See page 240.

Claſs 104. To Mr. ROBERT BELL, of Huntshill, near Jedburg, North Britain, for having improved four hundred and ſixty-eight acres of Land lying waſte, the SILVER MEDAL and TWENTY GUINEAS. See page 166.

Claſs 105. To Mr. JOHN FOX, of Boxhill, Surrey, for having improved one hundred and ſeventy-two acres of Land lying waſte, the SILVER MEDAL and TEN GUINEAS. See page 216.

IN POLITE ARTS.

Claſs 173. To Mr. CHARLES HENRY PARRY, of Bath, for a Drawing, Portrait of his Brother,

brother, in the character of a Shepherd Boy ſtruggling with a Ram, the SILVER MEDAL.

Claſs 175. To Mrs. MARY ROSE ROBINSON, Piccadilly, for a Drawing, Banditti at Market, after a deſign by Mortimer, the SILVER MEDAL.

Claſs 177. To Mr. JOHN JAMES MASQUERIER, No. 41, Tottenham Street, for a Drawing of the Statue of Joſhua Ward, Eſq, in conformity to the Will of John Stock, of Hampſtead, Eſq. the SILVER MEDALLION.

Claſs 180. To Mr. HENRY MILBOURNE, No. 38, Alſop's Buildings, Mary-le-Bone, for a Drawing of a Landſcape, View of Llanwrſt-Bridge, the GREATER SILVER PALLET.

To

Claſs 182. To Mr. STEPHEN FRANCIS RIGAUD, for an Hiſtorical Drawing, of Venus wounded by Diomed, the GOLD PALLET.

To Miſs FRANCES TALBOT, aged ſixteen, for a Painting after Raphael, the Virgin and Child, the SILVER MEDAL.

To Miſs CATHARINE MARY CRAUFURD, for a Drawing after a Caſt in plaſter, the Centaur Neſſus and Dejanira, the LESSER SILVER PALLET.

To JAMES BARRY, Eſq. in teſtimony of his public zeal and eminent abilities, manifeſted in the ſeries of Pictures in the Great Room of the Society, the GOLD MEDAL and TWO HUNDRED GUINEAS.

To

To Miſs KNIGHTS, for Buſts in Clay and Plaſter, hardened, the GREATER SILVER PALLET. See page 302.

To Mr. F. NICHOLSON, for diſcovering his Proceſs for producing the lights in ſtained Drawings, TWENTY GUINEAS. See page 296.

IN MECHANICKS.

To Mr. THOMAS COOK, of Newington, Surrey, for his eaſy and commodious method of turning Spheres, TWENTY GUINEAS. See page 335.

To Mr. SIMON GOODRICH, of Lambeth, for his new-conſtructed Clock with a Crank in place of an Eſcapement, SIXTY-FIVE POUNDS. See page 327.

To Mr. WM. FEATHERSTONHAUGH, of Cheſter-le-

le-ſtreet, Durham, for his method of counterbalancing the Ropes uſed in the deep Shafts of Mines, the SILVER MEDAL. See page 338.

To Mr. ROBERT HYNAM, of St. Peterſburgh, for his ingenious method of gauging Cutters for Wheels for Clock and Watch Makers, exemplified by an Inſtrument, Drawings, and various laborious calculations, the GOLD MEDAL. See page 307.

IN COLONIES AND TRADE.

Claſs 219. To SAMUEL MURE, Eſq. of Williamsfield Penn, in the pariſh of St. Elizabeth, in the Iſland of Jamaica, for his having made a Plantation of one hundred and one Bread-Fruit Trees, the SILVER MEDAL and TWENTY GUINEAS. See page 355.

PRESENTS

PRESENTS

RECEIVED BY THE

SOCIETY,

SINCE THE PUBLICATION OF THE SIXTEENTH VOLUME OF THESE TRANSACTIONS.

With the names of the DONORS.

BOOKS.

The ROYAL SOCIETY.

THE ſecond part of the 88th, and firſt part of the 89th Volume, of the Philoſophical Tranſactions.

The SOCIETY of ANTIQUARIES.

An Account of the Abbey Church of Bath, illuſtrative of the plans, elevations, and ſections of that Building.

Directors

The Honourable Directors of the East-India Company.

The first Number of the Second Volume of Prints of various Plants, the produce of the Coast of Coromandel.

The Right Honourable Sir Joseph Banks, Bart. P. R. S.

A Pamphlet, entitled a Narrative of the successful manner of cultivating the Clove Tree in the Island of Dominica, by William Urban Buce, Esq.

Sir John Anstruther, Bart.

A Pamphlet, entitled, Additional Remarks on Hoeing, Husbandry, &c.

Dr. James Anderson.

The five first Numbers of a Work, enentitled, Recreations in Agriculture, Natural History, Arts, and Miscellaneous Literature. To be continued.

Count Berchtold.

A Pamphlet, entitled, Descrizione del nuovo Rimedio curativo et preservativo contro la Peste.

Mr. WYATT.

The 53d, 54th, 55th, and 56th, Numbers of the Repertory of Arts and Manufactures.

Dr. FOTHERGILL.

A Pamphlet, entitled, a Preſervative Plan, or Hints for the Preſervation of Perſons expoſed to thoſe Accidents which ſuddenly ſuſpend or extinguiſh Vital Action, &c.

JOHN MIDDLETON, Eſq.

An octavo Volume, entitled, a View of the Agriculture of Middleſex.

GEORGE CUMBERLAND, Eſq.

A Quarto Volume of Outlines.

Mr. JOHN HIBBARD.

A Pamphlet, entitled, Thoughts (ſubmitted to cenſure) on the great Utility of circular and other Inland Canal Navigation in Britain, &c. &c.

Mr.

Mr. Michael Logan.

A Pamphlet, entitled, Obſervations relative to the Invention of the Marine Pyramid, or Spire Buoy, &c.

Mr. Josiah Taylor.

A Pamphlet, entitled, Reports, with Plans, Sections, &c. of the propoſed Dry Tunnel or Paſſage from Graveſend, in Kent, to Tilbury in Eſſex, &c. &c. by Mr. R. Dodd, Engineer.

The Secretary.

A Pamphlet, entitled, Propoſals for forming a Public Inſtitute, by Count Rumford.

PRINTS.

Mr. Sharp.

The Portrait of Mr. John Hunter; St. Cecilia; Two of Diogenes, one, a proof; Head of Chriſt; Virgin and Child; Holy Family, and Sortie at Gibraltar.

DRAWING.

Mr. SABBATIER.

A Drawing of an Apparatus for preſſing Cotton.

A

CATALOGUE

OF THE

MODELS AND MACHINES

Received since the Publication of the Sixteenth Volume of the Society's Transactions, with the Numbers as they are arranged in the Class to which they belong.

MECHANICKS. CLASS IV.

No. CLXXIV. A MACHINE for gauging Cutters, by Mr. Robert Hynam, for which the Gold Medal was voted to him. See page 307.

CLXXV. A Clock, by Mr. Simon Goodrich, for which he received a Bounty of Sixty-Five Pounds. See page 327.

CLXXVI. A Model of a Dead-Beat Eſcapement, accompanied by two explanatory Drawings, by Mr. Simon Goodrich.

CLXXVII. A large wooden Sphere, with ſeveral ſmaller ones, turned in a Lathe, according to the method deſcribed by Mr. Thomas Cook, for which he received a bounty of Twenty Guineas. See page 335.

CLXXVIII. A Model of a Machine for counterbalancing the Ropes uſed in the deep Shafts of Mines, by Mr. Wm. Featherſtonhaugh, for which he received the Silver Medal. See page 338.

A LIST

OF THE

OFFICERS of the SOCIETY,

AND

CHAIRMEN

OF THE SEVERAL

COMMITTEES,

Elected March 22, 1799.

PRESIDENT.

CHARLES Duke of Norfolk, F. R. and A. S.

VICE-PRESIDENTS.

Charles Duke of Richmond, K. G. F. R. and A. S.

William Henry Duke of Portland, K. G. F. R. and A. S.

Hugh Duke of Northumberland, K. G. F. R. and A. S.
Jacob Earl of Radnor, F. R. and A. S.
Charles Earl of Liverpool.
Charles Lord Romney, F. R. S.
Thomas Lord Rancliffe, F. R. and A. S.
Hon. Robert Clifford, F. R. and A. S.
Sir Wm. Dolben, Bart.
Sir Watkin Lewes, Knt.
Thomas Pitt, Esq. F. A. S.
Francis Stephens, Esq. F. R. and A. S.

SECRETARY.

Mr. Samuel More.

ASSISTANT-SECRETARY.

Mr. Thomas Taylor.

REGISTER.

Mr. George Cockings.

COLLECTOR.

Mr. Stephen Theodore Borman.

CHAIR-

CHAIRMEN OF THE SEVERAL COMMITTEES.

ACCOMPTS.

James Hebert, Esq.
Nathaniel Conant, Esq.

CORRESPONDENCE AND PAPERS.

Edward Bancroft, M. D. F. R. S.
Samuel Ferris, M. D. F. R. and A. S.

POLITE ARTS.

Caleb Whitefoord, Esq. F. R. and A. S.
Matthew Michell, Esq.

AGRICULTURE.

Rev. Stephen Eaton, A. M. and F. A. S.
Lannoy Richard Cousmaker, Esq.

MANU-

MANUFACTURES.

John Baker, Eſq.
Samuel Maſkall, Eſq.

MECHANICKS.

John Read, Eſq.
George Howe Browne, Eſq.

CHEMISTRY.

George Wilſon, Eſq.
Mr. Thomas Apreece Soley.

COLONIES AND TRADE.

Mr. Joſeph Pourcin.
John Baker, Eſq.

MISCELLANEOUS MATTERS.

Joſeph Jacob, Eſq.
William Kirkby, Eſq.

A

LIST

OF

CONTRIBUTING MEMBERS.

N. B. Thoſe marked with ** pay Five Guineas annually; thoſe marked with * Three Guineas annually; thoſe with P, are Perpetual members; thoſe with †† have ſerved the office of Steward; and thoſe marked with † are Stewards elect.

A.

ARGYLL, John Duke of
Athol, John Duke of, F. R. S.
Aileſbury, Thomas Earl of
Aynſley, Charles Lord of, *Littleharle Tower, Northumberland*
††Andrews, Sir Joſeph, Bart. *Shaw, Berks*
Arden, Right Honourable Sir Richard Peppar, M. P. Maſter of the Rolls, F. R. and A. S.
††P Abbot, Charles, Eſq. *Pall-mall*, M. P. F. R. and A. S.

Abdy,

Abdy, Rev. Thomas Abdy, *Cooper-ſale, Eſſex*
Adair, Alexander, Eſq. *Pall-mall*
††Adam, William, Eſq. *Albemarle-ſtreet*
Adam, William, Eſq. *Lincoln's-inn-fields*
Adam, Joſeph, M. D. *Queen-ſtreet, Golden-ſquare*
Adams, William, Eſq. M. P. *Craven-ſtreet*
Adams, John, Eſq. *Ely-place*
Adams, Dudley, Eſq. *Fleet-ſtreet*
Adamſon, Mr. David, *Oxford-ſtreet*
Affleck, Admiral Philip
Affleck, Col. James, *Vere-ſtreet, Cavendiſh-ſquare*
Agace, Daniel, Eſq. *Gower-ſtreet*
D'Aguilar, Hon. Ephraim Baron, *Broad-ſtreet Buildings*
Albin, William, Eſq. *Tokenhouſe Yard*
P Alexander, Claud, Eſq.
† Alexander, Mr. Daniel, *Lawrence Poultney-lane*
Allardyce, Alexander, Eſq. M. P. *Dunottur, Scotland, and St. James's-ſtreet*
††Allen, Edward, Eſq. *Clifford's-Inn*
††Allen, John, Eſq. *Clement's-Inn*, F. R. S.
††Allen, William, Eſq. *Lewiſham, Kent*
Allix, John Peter, Eſq. *Swaffam-houſe, Cambridgeſhire*
Anderſon, David, Eſq.
Andrews, Magnus, Eſq. *Piccadilly*
Angerſtein, John Julius, Eſq. *Pall-mall*
P Anneſly, Honourable Richard, Eſq. *Dublin*
P Antrobus, Edmund, Eſq. *New-ſtreet, Spring-gardens*

Arbuthnot,

Arbuthnot, George, Eſq. *King-ſtreet, Golden-ſquare*
Arkwright, Richard, Eſq. *Cromford, Derbyſhire*
Armſtrong, Mr. John, *Pimlico*
Armſtrong, the Rev. William, *Percy-ſtreet*
P Aſhby, Shuckbrugh, Eſq. F. R. S. *Great Ormond-ſtreet*
Aſhby, Henry, Eſq. *Chatham Place*
Aſhton, Nicholas, Eſq. *Woolton Hall, near Liverpool*
Aſhton, Mr. Iſaac, *Billiter-lane*
Aſlet, Mr. Robert, *Ludgate-ſtreet*
Aſtle, William Thornton, Eſq. *Clapham*
††Atcheſon, Nathaniel, Eſq. *Ely-place*
††Atlee, Mr. John, *Wandſworth*
Atlee, Mr. James, *Thames-ſtreet*
††PAubert, Alexander, Eſq. F. R. and A. S. *Auſtin-friars*

B.

P Bedford, Francis Duke of
**Buccleugh, Henry Duke of
P Bute, John Earl of, F. A. S.
P Buchan, David Earl of, LL. D. F. R. and A. S.
Briſtol, Right Rev. Frederick Earl of, F. R. S.
P Beverley, Algernon Earl of
P Brownlow, Lord, F. R. and A. S.
Bradford, Henry, Lord, *Weſton, Salop*
Braybrooke, Richard Lord

Bolton,

Bolton, Thomas Lord, F. A. S.
P Balgonie, Lord
P Bouillon, Prince of, Philip D'Auvergne, Captain in the Royal Navy, F. R. and A. S.
P Barrington, Honourable Daines, F. R. and A. S. *Temple*
Bruhl, His Excellency Count de, *Old Burlington-ſtreet*
Bruce, the Honourable Major-General, M. P.
Bowes, the Honourable George
Bowes, the Honourable Thomas
Berchtold, Honourable Count, *Prague, in Bohemia*
P Blacket, Sir Thomas, Bart.
Banks, the Right Honourable Sir Joſeph, Bart. Preſident of the Royal Society, K. B. and F. A. S. *Soho-ſquare*
Baring, Sir Francis, Bart, M. P. *Devonſhire-ſquare*
Burgeſs, Sir James Bland, Bart. *Duke-ſtreet, Weſtminſter*
Bruce, Governor James
Bacon, John, Eſq. R. A. *Newman-ſtreet*
††P Bacon, John, Eſq. F. A. S. *Temple*
††Bacon, Anthony, Eſq.
Bailey, Charles, Eſq. *Swallowfield, Berks*
Bailey, Mr. James, Surveyor, *Lambeth*
††Baker, John, Eſq. *Saliſbury-ſquare, Fleet-ſtreet*
††Baker, John, Eſq. *Princes-ſtreet, Spitalfields*
P Baker, William, Eſq. *ditto*
Balfour, John, Eſq.
Balmanno, John, Eſq. *Pump-court, Temple*

Bancroft,

Bancroft, Edward, M. D. and F. R. S. *Francis-ſtreet, Tottenham-court-road*

P Barclay, David, Eſq. *Red-lion-ſquare*

* Barclay, Robert, Eſq. F. L. S. *Terrace, Clapham*

* Barclay, Robert, Eſq. *Lombard-ſtreet*

Baring, John, Eſq. M. P. *Devonſhire-ſquare*

Barker, Richard, Eſq. *Taviſtock-ſtreet, Bedford-ſquare*

Barker, Mr. Charles, *Chandos-ſtreet*

P Barnard, William, Eſq. *Deptford*

P Barnard, Edward, Eſq. *ditto*

Barnard, Mr. Thomas, *Adelphi*

Barnard, Joſiah, Eſq. *Cornhill*

††Barnardiſton, Nathaniel, Eſq. *Harpur-ſtreet*

Barnet, Edward, Eſq. *Soho-ſquare*

Barrington, the Rev. George, *Durham*

Barry, Henry Alexander, Eſq. *Everſley Lodge, Hants*

Bartlett, Patrick, Eſq.

P Bartolozzi, Francis, Eſq. R. A. *North-end*

Bates, Mr. George Ferne, *No.* 40, *Hatton Garden*

Bate, John, Eſq. *Bedford-row*

Batſon, Edward David, Eſq. *Lombard-ſtreet*

Baverſtock, Mr. James, *Windſor*

P Bean, Mr. Nathaniel, *King's-road, Bedford-row*

P Bean, Mr. Iſaac, *ditto*

Bearcroft, Philip, R. Eſq. *Vere-ſtreet*

Bearcroft, Edward, Eſq. *South Lambeth Place*

Beatſon, Robert, Eſq. *Kilrick, Scotland*

Beaumont, Albanus, Eſq. *Kingſton, Surry*

Beaumont,

Beaumont, Daniel, Esq. *Great Russel-street*
††Beard, John, Esq. F. A. S. *Doctors-commons*
Beazely, Charles, Esq. *Blackfriars-road*
Beddall, Mr. John, *Jekyls, Fenchingfield, Essex*
Belisario, Mr. John, *Gerard's Cross, Bucks*
Bell, William, Esq. *Guernsey*
Bell, William, Esq. *Norfolk-street, Strand*
Bell, Mr. Anthony, *Charlotte-street, Pimlico*
Belsches, Robert, Esq. *St. James's Place*
Bennett, James, Esq. *Bedford-square*
Benezech, Mr. Peter, *Beaufort-buildings*
Bent, Ellis, Esq. *Warrington*
Bent, Mr. William, *St. Martin's-lane*
Bentham, General Samuel, *Queen's-square, Westminster*
Bentley, Cumberland, Esq. *Abingdon-street*
††Benwell, Joseph, Esq. *Battersea*
Berners, Charles, Esq. *Queen-Ann-street, West*
Berger, Mr. Lewis, jun. *Bow-lane, Cheapside*
Berwick, Joseph, Esq. *Hollow-park, near Worcester*
Biddulph, Robert, Esq. M. P. *Arlington-street*
Bignell, William, Esq. *Seething-lane*
Bingley, Thomas, jun. Esq. *Birchin-lane*
Bingley, Mr. John, *John-street, Tottenham-court-road*
Birch, Thomas James, Esq. Capt. of the 1st Regiment of Life Guards
††Birkhead, Charles, Esq. *Ryegate, Surry*
Bishop, Nathaniel, Esq. *Yorkshire*
Bisset, Capt. Robert, Commissary-General, *Great Pulteney-street*

Blaauws,

Blaauws, William, Esq. *Queen-Ann-street West*
††Blades, John, Esq. *Ludgate-hill*
Black, Mr. George, *Princes-street, Bank*
Blackburne, John, Esq. M. P. F. R. S. *Park-street, Westminster*
Blair, Alexander, Esq. *Wimpole-street*
††Blake, William, Esq. *Aldersgate-street*
Blane, William, Esq. F. R. S. *Arlington-street*
Blizard, Mr. William, F. R. and A. S.
Blomefield, Colonel, *Shooter's-hill*
Boddington, Thomas, Esq. *Mark-lane*
P Boehm, Edmund, Esq. *Broad-street*
Boddy, Mr. Francis, *Warwick-lane*
Boddy, John, Esq. *Thames-street*
Bonar, Thompson, Esq. *Broad-street-buildings*
Bontine, William Graham, Esq. M. P.
Borman, Mr. William, *Winchester*
Bostock, the Rev. John, *Windsor*
Bostock, Samuel, Esq. *Borough*
P Bosville, William, Esq. F. R. S. *Gunthwaite Hall, Yorkshire*
Botfield, Thomas, jun. Esq. *Ditton, near Bewdley, Worcestershire*
Botham, Peter Thompson, Esq. *Great Cumberland-street, Oxford-road*
Boulton, Matthew, Esq. F. R. S. *Soho, near Birmingham*
Bousfield, George, Esq. *King's Bench Walk*
††Bowzer, Richard, Esq. *near St. John's Church, Southwark*

††Boydell, John, Esq. and Alderman, *Cheapside*
Bracken, Rev. Thomas, *Jermyn-street, St. James's*
Bradley, James, Esq. *Berners-street*
Bradstreet, Robert, Esq. *Higham, Suffolk*
Braithwaite, Daniel, Esq. F. R. and A. S. *Post-Office*
Braithwaite, Mr. John, *Brook-street, Tottenham-court-road*
Bramah, Mr. Joseph, *Piccadilly*
Brand, Thomas, Esq. *Soho-square*
Brehm, Major Diederick, *South Molton-street*
Brettingham, Robert, Esq. *Berkeley-square*
P Brickwood, John, Esq. *Billiter-square*
Brickwood, Mr. Nathaniel, *Thames-street*
Bridgeman, Richard Whalley, Esq.
Bridge, Mr. Thomas, *Southwark*
††P Broadhead, Theodore Henry, Esq. F. A. S. *Portland-place*
Brockbank, Mr. Joseph, *Crescent, New Bridge-street, Blackfriars*
Brodie, Alexander, Esq. M. P. *Argyle-street*
††Brodie, Alexander, Esq. *Carey-street*
Brodie, John, Esq. *Clifford's-inn*
Bromfield, Philip, Esq. *Lymington, Hants*, and *Gerrard-street*
*P Brooke, Richard Brooke de Capell, Colonel, F. R. S. *Great Oakley, Northamptonshire*
Brotherson, Mr. Clement, *Great Russel-street, Bloomsbury*
Brounlie, John, M. D. *Carey-street, Lincoln's-inn*

Brown,

Brown, Thomas, Esq. *Adelphi*

Brown, Mr. George, *Southampton-row, Tottenham-court-road*

Brown, Jonathan, Esq. *Buckingham-street*

Browne, Isaac Hawkins, Esq. M. P. F. R. S. *South Audley-street*

Browne, Francis John, Esq. M. P. *Cavendish-square*

Browne, George Howe, Esq. *Bedford-street, Covent-garden*

Browne, Mr. Robert, *Kew*

Brudenell, George Bridges, Esq. *Great George-street, Westminster*

Bryer, Mr. Robert, No. 58, *Strand*

Bucknall, Thomas Skip Dyot, Esq. M. P. *Baker-street, Portman-square*

Buckell, George, Esq. jun. *Chepstow, Monmouthshire*

Buller, John, Esq. *Morval, Cornwall,* and *Glouceſter Place, Portman-square*

Bullock, John, Esq. *Tower*

Burdon, Mr. William, *Chatham-square*

† Burgoyne, Montague, Esq. *Mark-hall, Harlow, Essex*

Burnett, Robert, jun. Esq. *Vauxhall*

Bury, Edward, Esq. *Walthamstow*

Butt, Mr. James Strode, *Dover-place, Kent-road*

Butts, Mr. John, *Bridge-street, Blackfriars*

Byerley, Mr. Thomas, *York-street, St. James's square*

††Byfield, George, Esq. *Craven-street*

C.

Clermont, Earl

Cremorne, Thomas Lord Viſcount

††Chetwynd, Richard Lord Viſcount

Couï, Charles Marquis de

Conyngham, Right Honourable William, F. A. S.

Cavendiſh, Hon. Henry, F. R. and A. S. *Gower-ſtreet, Bedford-ſquare*

*††Clifford, the Honourable Robert, V. P. F. A. S. *Bruton-ſtreet*

Cochrane, the Honourable John, *Harley-ſtreet*

**Calonne, Charles Alexandre de, Count d'Hannonville

Coghill, Sir John, Bart.

P Carnegie, Sir David, Bart, M. P.

Cathcart, Sir Andrew, Bart.

Campbell, Governor William

Cairns, Thomas, Eſq. *Martin's-lane, Cannon-ſtreet*

††Caley, John, Eſq. F. A. S. *Gray's-inn*

Callender, John, Eſq. M. P.

Caldecott, John, Eſq. *Rugby, Warwickſhire*

Campbell, Duncan, Eſq. *Adelphi*

Campbell, Archibald, Eſq. *Argyll-ſtreet*

Camper, Peter Everard, Eſq. *Devonſhire-ſtreet, Portland-place*

Capper, Francis Hall, Eſq. *Queen's College, Oxford*

Carden, James, Eſq. *John-ſtreet, Adelphi*

Carew, Reginald Pole, Eſq. M. P. F. R. and A. S. *Charles-ſtreet, Berkeley-ſquare*

Cartwright,

Cartwright, Charles, Eſq. *India-houſe*
Cartwright, Rev. Edmund, *Marybone Park*
Caſlon, William, Eſq. *Saliſbury-court*
†PCater, Mr. Richard, *Bread-ſtreet, Cheapſide*
Chadwick, Thomas, Eſq. *Hampton, Middleſex*
Chalie, John, Eſq. *Bedford-ſquare*
Chambers, Chriſtopher, Eſq. *Mincing-lane*
Champernoun, John, Eſq. *Totneſs, Devon*
Chandler, Henry John, Eſq.
Charington, John, Eſq. *Mile-end*
Cherry, Benjamin, Eſq. *Hertford*
Chippendale, Mr. Thomas, *St. Martin's lane*
Chriſtie, Daniel Beat, Eſq.
Chriſtian, John Giles, Eſq. *Doctors-commons*
Claridge, John, Eſq. *Upton-on-Severn, Worceſter-ſhire*
Clarke, Richard, Eſq. *Lawn, South Lambeth*
P Clark, Mr. James
††Clarke, Richard, Eſq. Chamberlain, *Bridge-ſtreet, Blackfriars*
Clark, Ralph, Eſq. *Robert-ſtreet, Adelphi*
Clarke, Mr. Henry, *Gracechurch-ſtreet*
Clarke, Richard, Eſq. *Worceſter*
Clarke, John, Eſq. *Albemarle-ſtreet*
Clarke, William, Eſq. *Tynemouth, Northumberland*
Clark, James, Eſq. M. D.
Clark, John George, Eſq. *Lincoln's-inn*
Clay, Henry, Eſq. *Birmingham*
† Cleland, Walter, Eſq. *Adelphi Terrace*

Clephane, Colonel William Macleane
Cloſe, Rev. Henry John, *Ipſwich*
Cole, Benjamin, Eſq. *Batterſea-riſe, Surrey*
Cole, Robert, Eſq. *Windſor*
Coleman, Edward, Eſq. Profeſſor at the Veterinary College
P Colen, Joſeph, Eſq. Governor of York Fort, *Hudſon's Bay*
Collier, Mr. Joſhua, *Little Buſh-lane, Upper Thames-ſtreet*
††Collins, Thomas, Eſq. F. A. S. *Berners-ſtreet*
Collins, Benjamin Charles, Eſq. *Saliſbury*
Colliſon, Mr. John, *Carſhalton*
Colquhoun, Patrick, Eſq. *Hoxton-ſquare*
Combe, Harvey Chriſtian, Eſq. Alderman, M. P. *Great Ruſſel-ſtreet, Bloomſbury*
Combrune, Gideon, Eſq. *Berners-ſtreet*
Compton, Mr. Henry, *Charlotte-ſtreet, Pimlico*
††Conant, Nathaniel, Eſq. *Great Marlborough-ſtreet*
P Coningham, James, Eſq. *Pancras-lane, Queen-ſtreet*
Cook, Major William, *Little Ormond-ſtreet*
Cooke, Mr. John Kenworthy, *Red-lion-ſquare*
Coombe, Wm. Eſq.
Cooper, Mr. Benjamin, *Earl-ſtreet, Blackfriars*
Cooper, Allen, Eſq. *John-ſtreet, Bedford-row*
Cope, William, Eſq. *Sanctuary, Weſtminſter*
Copely, Thomas, Eſq. *Netherall, near Doncaſter, Yorkſhire*
P Coppens, B. M. D. *Ghent, Flanders*

Corbyn,

Corbyn, Mr. John, *Holborn*
Coſſer, Stephen, Eſq. *Abingdon-ſtreet*
Cottsford, Edward, Eſq.
Couſſmaker, Lannoy Richard, Eſq. *Gower-ſtreet, Bedford-ſquare*
Couſſmaker, William Kops, Eſq. *Hackney*
Cowell, George, Eſq. *America-ſquare*
Cox, Robert Albion, Eſq. *Little Britain*
Cox, Mr. William, *Beaufort buildings*
Coxwell, Mr. Henry, *Fleet-ſtreet*
Cradock, Joſeph, Eſq. M. A. and F. A. S. *Gumley, Leiceſterſhire*
Craig, Charles Alexander, Eſq. *Great Scotland-yard*
Crawford, John, Eſq. *Newman-ſtreet*
††Crawſhay, Richard, Eſq. *George Yard, Thames-ſtreet*
††Crawſhay, William, Eſq. *ditto*
Crawley, Samuel, Eſq. *Ragnal-hall, Nottinghamſhire*
Creak, Mr. William, *Cornhill*
Criſp, John, Eſq. F. R. S. *Abroad*
Criſwell, Mr. William, *Bedford-row*
Crocker, Benjamin, Eſq. *Ardwick-green, Mancheſter*
Crocker, Mr. Abraham, *Froome, Somerſetſhire*
Crook, Thomas, Eſq. *Tytherton, near Chippenham, Wilts*
Crook, John, Eſq. *Bryanſtone-ſtreet*
Croſs, William, Eſq. *Thorngrove-houſe, Worceſter*
Crowder, William Henry, Eſq. *Frederick's-place, Old Jewry*

††Crowther, Philip Wyatt, Esq. *Guildhall*
Cunningham, William, Esq.
Curtis, John, Esq. *Mile-end*
Curwen, John Christian, Esq. M. P.

D.

**Devonshire, William, Duke of
**Dartmouth, William, Earl of, F. R. S.
Dundas, Thomas Lord, F. R. and A. S.
Dundas, the Right Hon. Henry, M. P. *Somerset-place*
P Dolben, Sir William, Bart. V. P. M. P. *Bridge-court, Channel-row, Westminster*
Denham, Sir James Stewart, Bart. M. P.
Douglass, Admiral John, *Chichester*
Dallison, Mr. Thomas, *Wapping*
Dampier, Edward, Esq. *Grove-place, Hackney*, and *Harpur-street*
Dancer, Mr. John, *Doncaster*
††P Daniel, John, Esq. *Mincing-lane*
Daniell, James, Esq. *Upper Wimpole-street*
Davenport, John, Esq. *John street, Adelphi*
D'Aubant, General Abraham, F. R. and A. S.
Davis, Mr. Jonas, *Chancery-lane*
Davis, Mr. Thomas
Davies, the Rev. J. D. D. F. R. and A. S. Provost, *Eaton*
Davies, Rees, Esq. *Swansea*
Davison, Mr. Thomas, *Lombard-street, Whitefriars*

Davison,

Daviſon, George, Eſq. *Broad-ſtreet Buildings*
Daviſon, Alexander, Eſq. *Swarford, Northumberland*
Dawes, John, Eſq. *Pall-mall*
Dawſon, William, Eſq. *Mancheſter-ſquare*
Dawſon, Mr. Thomas, *Weymouth-ſtreet, Portland-place*
Dawſon, Mr. Robert, *St. Paul's Church-yard*
† Day, Thomas, Eſq. *Leiceſter-place, Leiceſter-fields*
Deane, John, Eſq. *Hythe, near Southampton*
Deane, Mr. Matthias, *Walton-place, Blackfriars-road*
Delafield, Joſeph, Eſq. *Caſtle-ſtreet, Long-acre*
Devalaud, George, Eſq. *Bloomſbury-place*
De l'Hoſte, Lieut. Colonel, *Weymouth-ſtreet, Portland Place*
††Dent, Robert, Eſq. F. A. S. *Temple-bar*
Dent, John, Eſq. M. P. F. A. S. *ditto*
P††Dent, William, Eſq. *Batterſea-riſe*
Denſanges, Mr. William, *Wheeler-ſtreet, Spitalfields*
Deſenfans, Noel, Eſq. *Charlotte-ſtreet, Portland-Place*
Devall, Mr. John, *Portland ſtreet*
Devaynes, John, Eſq. *Spring-gardens*
††Devis, Arthur William, Eſq. Member of the Aſiatic Society, Bengal, *George-ſtreet, Hanover-ſquare*
Dickinſon, Charles, Eſq. *Abroad*
Dickinſon, Henry, Eſq. *Leadenhall-ſtreet*
Dickinſon, Charles, Eſq. *No.* 56, *Warren-ſtreet*

Digby,

Digby, Kenelm, Esq.
Ditcher, Philip, Esq. *East Bergholt, Suffolk*
Dixon, Marcus, Esq. *London-street, Fenchurch-street*
Doe, Thomas, Esq. *Bygrave Park, Herts*
Dollond, Mr. Peter. *St. Paul's Church-yard*
Dollond, Mr. John, *ditto*
Dorrett, John, Esq. *Bruton-street*
Douce, Thomas Augustus, Esq. *Townmalling, Kent*
Doughty, John, Esq. *Aldermanbury*
P Douglass, William, Esq. *America-square*
Dowbiggin, Mr. Lancelot
Dowbiggin, Samuel, Esq. *Hatfield-Regis, Herts*
Down, Richard, Esq. *Bartholomew-lane*
Downer, Mr. Henry, *Fleet-street*
Drake, George, Esq. *Bedford-square*
Drake, Francis, Esq. *Wimpole-street*
Drake, Mr. Samuel, *Margaret-street, Westminster*
P Draper, Daniel, Esq. *St. James's street*
Draper, Mr. John, *Clayton-place, Kennington-road*
Driver, Mr. William, *Kent-street-road*
Duberley, James, Esq. *Soho-square*
Du Bois, John Frederick, Esq. *James-street, Adelphi*
Du Bois, Edward, Esq. *ditto*
Dundas, Robert, Esq. M. P. *Somerset-place*
Dundass, David, Esq. *Richmond, Surry*
Dunn, Samuel, Esq. *Adelphi*
P Duroure, Colonel John, F. R. and A. S.
††*Duval, the Rev. Philip, D. D. F. R. and A. S. *Newman-street*

E.

††P Egremont, George Wyndham, Earl of
Eardley, Sampſon Lord, M. P. F. R. and A. S.
Einſiedel, his Excellency Count
Elphinſtone, the Honourable William
Eden, Sir John, Bart. M. P.
Eden, Sir Frederick Morton, Bart. F. A. S.
Erſkine, Sir William, Bart. M. P.
Earle, Henry, Eſq. *Gower-ſtreet*
Eaton, Rev. Stephen, A. M. and F. A. S. *St. Ann's, Soho*
P Eaton, Peter, Eſq. *Weſtford, Eſſex*
Echardt, Francis Frederick, Eſq. *Whiteland Houſe, Chelſea*
P Eckerſall, John, Eſq. *Burford Houſe, near Dorking, Surry*
Eccles, the Rev. Allan Harriſon, *Bow, Middleſex*
P Eccleſton, Thomas, Eſq. *Scareſbrick, Lancaſhire*
Edwards, John, Eſq. *Warnford-court*
Edwards, Bryan, Eſq. M. P. F. R. and A. S. *Great George-ſtreet*
Edwards, Samuel, Eſq. *Stamford, Lincolnſhire*
Edwards, Mr. John, *at Mr. Wood's, No.* 35, *Broad-ſtreet-buildings*
Ellill, John, Eſq. *Queen-ſtreet, Cheapſide*
Elliot, John, Eſq. *Pimlico*
P Errington, John, Eſq. *Stanhope-ſtreet, May-fair*
Eſdaile, Joſh, Eſq. *Albyns, Eſſex*

*††Ewer,

*††Ewer, Samuel, Esq. F. L. S. *Hackney*
P Ewbank, Andrew, Esq. *Upper Grosvenor-street*

F.

††Fife, James, Earl of, F. R. and A. S.
††Falmouth, George Evelyn Lord Viscount
Finch, Honourable Captain William, *Albury, near Guildford*
Fludyer, Sir Samuel, Bart. *Baker-street, Manchester-square*
P Fletcher, Sir Henry, Bart. M. P. *Southampton-row, Bloomsbury*
††Ford, Sir Francis, Bart. *Queen-Ann-street West*
Farquhar, Sir Walter, Bart. *Conduit-street*
Fairman, William, Esq. *Lynsted, Kent*
Farmer, Samuel, Esq. *Beckenham, Kent*
Farell, Rev. Charles, *Bungton, near Kimbolton, Huntingdonshire*
Fearon, Henry, Esq. *John-street, Adelphi*
P Felton, Samuel, Esq. F. R. and A. S. *Carburton-street, Fitzroy-square*
P Fermor, William, Esq.
††Ferris, Samuel, M. D. F. R. and A. S. *Harpur-street*
Feuilleteau, William, Esq. F. R. and A. S. *Charlotte-street, Rathbone-place*
Filmer, Beversham, Esq. *King's-road*
Fitzherbert, Thomas, Esq. *Roehampton, Surry*
Fleetwood, Robert, Esq. *Ely-place*

Fletcher,

Fletcher, James, M. D.
Fletcher, Mr. Thomas, *Bridge-ſtreet, Blackfriars*
Fludyer, George, Eſq. M. P.
Forde, the Rev. Brownlow, D. D. *Newgate-ſtreet*
Fordyce, George, M. D. F. R. S. *Eſſex-ſtreet, Strand*
Forſyth, William, Eſq. F. A. S. *Kenſington*
Foulſton, Mr. John, *No.* 18, *Frith-ſtreet, Soho*
Fowle, Dr. William, *Cecil-ſtreet, Strand*
††Fowler, David Burton, Eſq. *Fig-tree-court, Temple*
P Franco, Jacob, Eſq. *Gerrard's-Croſs*
Frankland, William, Eſq. *Cavendiſh-ſquare*
Franklin, Captain William, *Beaufort-buildings, Strand*
Fraſer, James, Eſq. *Golden-ſquare*
Fraſer, Simon, Eſq. *King's-arms-yard, Coleman-ſtreet*
Fraſer, William, Eſq. F. R. S. *Queen-ſquare, Holborn*
Fraſer, Mr. David, *Great Pultney-ſtreet*
French, Mr. George, *Eaſt Cheap*
Frend, Mr. George, *Abroad*
Fry, Edmund, Eſq. *Type-ſtreet, Chiſwell-ſtreet*
Fry, Mr. Joſeph Storrs, *Briſtol*
Fry, Mr. Henry, *Middle Moorfields*
Fullarton, Colonel William, M. P. and F. R. S. *Parliament ſtreet*
Fulton, Henry, Eſq. *Watling-ſtreet*

G.

Gordon, Alexander Duke of, K. T. and F. R. S.
* Groſvenor, Richard Earl of, F. R. S.
Glencairn, Earl of
Glaſgow, George Earl of, F. R. and A. S.
P Gallaway, Arundell Lord Viſcount, M. P. and K. B.
P Greville, Right Hon. Charles, M. P. and F. R. S.
Greville, the Honourable Robert, F. R. and A. S.
Grey, Sir Henry, Bart. *Howick, Nothumberland*
††Gaſcoigne, Sir Thomas, Bart. F. A. S. *Partington, in the County of York*
Green, Major-General Sir William, Bart. F. R. and A. S. *Chandos-ſtreet, Cavendiſh-ſquare*
P Geary, Sir William, Bart. M. P. *Oxen Heath, Kent*
Galloway, James, Eſq. *Gower-ſtreet*
Gape, Joſeph, Eſq. *Bridge-ſtreet, Weſtminſter*
Garnett, David, Eſq. *Baſinghall-ſtreet*
Garnet, Robert, Eſq. *Fenchurch-ſtreet*
Garrett, Daniel, Eſq. *Portſmouth*
Garthſhore, Maxwell, M. D. F. R. and A. S. *St. Martin's lane*
Garthſhore, William, Eſq. M. P. *Mancheſter-ſquare*
Gee, John, Eſq. *Wardour-ſtreet, Soho*
Gibbes, George Smith, M. A. *Magdalen College, Oxford*
Gilbert, Mr. Henry, *Holborn*
Gillet, Gabriel, Eſq. *Guildford-ſtreet*

Giſborne,

Giſborne, Thomas, M. D. *Clifford-ſtreet*
Giſt, Samuel, Eſq. *Gower-ſtreet*
Glanville, Mr. Edward, *Broad Sanctuary, Weſtminſter*
P Godſchall, William Man, Eſq. F. R. and A. S.
Godwin, James, Eſq. *Wingfield, Berks*
Golden, Robert, Eſq. *Red-lion-ſtreet*
Goldthwaite, Thomas, jun. Eſq.
Goodwyn, Henry, jun. Eſq. *Eaſt Smithfield*
Goodchild, Mr. Thomas, *Tooley-ſtreet*
Goodhew, William, Eſq. *Deptford*
Gotobed, John, Eſq. *Norfolk-ſtreet, Strand*
Gordon, Edward, Eſq. *Bromley, Middleſex*
Goſling, William, Eſq. F. A. S. *Fleet-ſtreet*
Goſling, Francis, Eſq. *Fleet-ſtreet*
Graham, George, Eſq.
Graham, Aaron, Eſq. F. R. S. *Great Ruſſel-ſtreet*
Grant, General James, *Sackville-ſtreet*
Græme, General David, *Lower Seymour-ſtreet*
Grant, Major John, *Hill-ſtreet, Berkeley-ſquare*
††Grant, John, Eſq. *Fleet-ſtreet*
Grant, Peter, Eſq. *Fort Auguſtus, North Britain*
P††Gray, Walker, Eſq. *London-ſtreet*
Gray, John, Eſq. *Somerſet-place*
P Green, Rupert, Eſq. *Percy-ſtreet, Rathbone-place*
Green, Mr. Joſeph, *Tower-ſtreet*
Green, Mr. William, *Deptford*
††Greene, Thomas, Eſq. F. A. S. *Gray's-inn*
Greene, Joſeph, Eſq. *New Baſinghall-ſtreet*
Greenwood, Abraham, Eſq. *Staining-lane*
P Gregory, Robert, Eſq. *Berners-ſtreet*
Grenfell, William, Eſq. *Copper Office, Thames-ſtreet*

Gower,

Gower, Charles, Esq. *Edmonton*
Gresley, Rev. William
Grieve, John, M. D. F. R. and A. S. *Norfolk-street, Strand*
Griffin, Mr. John, *Steward-street, Spitalfields*
P†† Griffith, Edward, Esq. of *Caernarvon*
Griffith, John, Esq. *Queen-square, Bloomsbury*
Groote, George William, Esq. *Dean-Street, Soho*
Grosvenor, Richard Erle Drax, Esq. M. P. *Berkeley-street, Manchester-square*
P Grote, George, Esq. *Threadneedle-street*
Groves, John, Esq. *Sloane-street, Knightsbridge*
††Grubb, John, Esq. *Lincoln's-inn-fields*
Gubbins, Mr. James, *Surry-street*
Gwillim, Henry, Esq. *Boswell-court, Carey-street*

H.

††*Hardwicke, Philip Earl of, F. R. and A. S.
Hawke, Martin, Lord
Heathfield, Francis Augustus Lord
Hasslang, His Excellency Count
Harcourt, Honourable General William
Honeywood, Sir John, Bart. M. P. *Bedford-square*
Hume, Sir Abraham, Bart. F. R. S. *Wormleybury*
Hanmer, Sir Thomas, Bart. *Hanmer, Flintshire*
Heathcote, Sir John, *Edensor, Langton Hall, Staffordshire*
Harley, Rt. Honourable Thomas, Alderman, M. P. *Aldersgate-street*

Hope,

Hope, the Rt. Honourable Brigadier-General John
Hope, the Honourable Lieutenant-Colonel Charles
Herne, Sir William, Alderman
Hay, Major-General Alexander
Haring, John, Esq. *George-street, Hanover-square*
Hadley, Mr. Nathaniel, *Long-acre*
Hall, Mr. Abraham, *Aldermanbury*
Hall, Mr. Luke, *Gutter-lane, Cheapside*
Hall, Phinehas, Esq. *Hans-place, Sloane-street*
Hall, James, Esq. *King-street, Holborn*
Hallet, William, Esq. *Farringdon, Berks*
Hamilton, Rev. Anthony, D. D. F. R. and A. S. *Saville-row*
Hamilton, William, Esq. *Blackheath*
Hamilton, William, M. D. *Old Broad-street*
Hammett, John, Esq. *Lombard-street*
††Hammond, William Parker, Esq.
Handasyde, Mr. Gilbert, *Green-walk, Southwark*
Hankey, Joseph, Esq. *Poplar*
Hanmer, Job, Esq. *Holbrook-Hall, Sudbury*
Hanson, John, Esq. *Bruton-street*
Hardcastle, Joseph, Esq. *Duck's-foot-lane*
Harding, John, Esq. *College-street, Westminster*
P††Harman, Jeremiah, Esq. *Princes-street, Lothbury*
Harper, Robert John, Esq. *British Museum*
Harris, Robert, Esq. Banker, *Reading*
Harrison, Richardson, Esq. *Freern-Barnet, Middlesex*
Harrison, Thomas, Esq. *Wolverton, Bucks*

Harrop, Joſeph, Eſq. *Great Marlborough-ſtreet*
Hart, Mr. Henry, *Lamb's-Conduit-ſtreet*
Harvey, Robert, M. D. *Adelphi*
Harwood, William, Eſq. *Hanwell-park*
Haſſal, Charles, Eſq. *Eaſtwood, Pembrokeſhire*
* Haſtings, Warren, Eſq. *Park-lane*
Hawkins, John, Eſq. F. R. S.
Hay, Robert, Eſq. *Portland Place*
Hay, James, Eſq. *Great Portland-ſtreet*
Hay, Colonel Patrick, *Upper Norton-ſtreet*
Hayward, Mr. Richard, *Piccadilly*
††Heaviſide, Richard, Eſq. *Somerſet-ſtreet, Portman-ſquare*
† Heaviſide, John, Eſq. *George-ſtreet, Hanover-ſquare*
P††Hebert, James, Eſq. *Great Portland-ſtreet*
Hele, John, Eſq. *Charlotte-ſtreet, Rathbone-place*
††Henderſon, John, Eſq. LL. B. and F. A. S. *Terrace, Adelphi*
Hennell, David, Eſq. *Foſter-lane*
Hepworth, John, Eſq. *York*
Heron, Patrick, Eſq. M. P. *Cavendiſh-ſquare*
Hewlet, Mr. William, *Strand*
Hewetſon, John, Eſq. *Tower-hill*
Hewitt, Mr. Henry Thomas, *Keene's-row, Walworth*
Hicks, Mr. John, *Brighton*
Higgins, Matthew, Eſq. *Conduit-ſtreet*
Hilton, John, Eſq. *Ironmonger-lane, Cheapſide*
Hill, Richard, Eſq. *Plymouth, Glamorganſhire*
Hill, Edward, Eſq. *Albion-ſtreet, Blackfriars-road*

P Hoare,

P Hoare, Charles, Eſq. F. A. S. *Chapel-ſtreet, Groſvenor Place*
Hoare, Jonathan, Eſq. *Stoke Newington*
Hobbs, Mr. Joſeph, *Margaret-ſtreet, Cavendiſh-ſquare*
P Hobſon, William, Eſq.
Hobſon, George, Eſq.
Hodgſon, Mr. George, *Lambeth-marſh*
Hood, Alexander, Eſq. *Royal Navy*
Hodgkinſon, Mr. Sampſon, *Snow-hill*
P Holder, James, Eſq. *Aſh-park*
P Holland, Henry, Eſq. F. A. S. *Sloane-place, Knightſbridge*
Holland, Mr. Richard, *Half-moon-ſtreet, Piccadilly*
Holland, Mr. George, *High Holborn*
Holliday, John, Eſq. F. R. S. *Great Ormond-ſtreet*
Hollis, Thomas Brand, Eſq. F. R. and A. S. *Cheſterfield-ſtreet*
Holcombe, Rev. William, *Canon of St. David's*
Holmes, Mr. John, *Whitefriars*
Holme, Mr. William, *Baſs-court, Thames-ſtreet*
Home Patrick, Eſq. M. P. *Gower-ſtreet*
Homfray, Samuel, Eſq. *Mirthir Tidville, Glamorganſhire*
Honeybourne, Mr. Robert, *Stourbridge*
Honeywood, Filmer, Eſq. M. P. *Charles-ſtreet, Berkeley-ſquare*
Honyman, Captain Robert, M. P. *Royal Navy*
Hooper, Thomas, Eſq. *Panty Goitre, Monmouthſhire*

Horner, Thomas, Esq. *Mell's Park, near Froome, Somersetshire*
Hornocks, John, Esq. *Preston, Lancashire, or No. 5, Bucklersbury*
Horton, Mr. William, *Newgate-street*
Hotham, John, Esq. *Middle Temple-lane*
P Houghton, William, Esq. *Conduit-street*
P Howard, Edward, Esq. F. R. S. *Doughty-street*
Howard, Barnard, Esq. *Farnham, Suffolk*
Howell, Richard, Esq. *Thames-street*
Howell, Mr. John, *Vine-street, Piccadilly*
Howarth, Richard, Esq. F. S. A. *Chancery-lane*
P Hudson, Vansittart, Esq. *Temple*
Hughes, Rev. Edward, *Kinmell Park, St. Asaph*
Hulme, William, Esq. *Twydale, Kent*
Hunt, Rowland, Esq.
Hunter, John, Esq. M. P. *Bedford-square*
Hurt, Charles, Esq. *Wirksworth, Derbyshire*
Hussey, William, Esq. M. P. *Salisbury*
Hyde, John, Esq.

I.

P Ilchester, Henry Thomas Earl of
Johnstone, the Honourable Lieutenant-Colonel Cochrane, M. P.
††Ingilby, Sir John, Bart. M. P. F. R. and A. S.
Johnston, Sir William, Bt. *Queen-street, May-fair*
P Jackson, William, Esq. *Dowgate-wharf*
††Jacob, Joseph, Esq. *Greek-street, Soho*

Jardin,

Jardin, Mr. John, *Throgmorton-ſtreet*
P Idle, Chriſtopher, Eſq. *Strand*
Jeffery, George, Eſq. *Throgmorton-ſtreet*
Jefferys, Thomas, Eſq. *Cockſpur-ſtreet*
Jefferys, Mr. George, *Brick-lane, Old-ſtreet*
Jefferys, Mr. George
P Jenkins, Thomas, Eſq. *Rome*
P Jenour, Joſhua, Eſq. *Fleet-ſtreet*
Jervoiſe, Jervoiſe Clark, Eſq. M. P. *Hanover-ſquare*
Jeudwine, Thomas, Eſq. *Baſinghall-ſtreet*
Ince, William, Eſq. *Broad-ſtreet, Carnaby-market*
Inglis Hugh, Eſq. *Bedford-row*
Innes, Hugh, Eſq. *Taviſtock-ſtreet, Bedford-ſquare*
Johnſon, Alexander, LL. and M. D. *Portland-ſtreet*
††Johnſon, John, Eſq. *Mary-le-bone-ſtreet*
Johnſon, John, jun. Eſq. *Berner's-ſtreet*
Johnſon, Mr. James, *Bryanſtone-ſtreet*
Johnſon, James, Eſq. *Lambeth Walk*
Johnſton, Alexander, Eſq. *Drury-lane*
Jones, Edward, Eſq. *Weprehall, Flintſhire*
Jones, John, Eſq.
Jones, John, Eſq. *Frankley, Wiltſhire*
Jones, Mr. Francis, *Groſvenor-ſtreet*
Jones, Mr. John, *Charlotte-ſtreet, Manſion-houſe*
Jones, Griffith, Eſq. *Auſtin-friars*
Jones, Henry, Eſq. *Old City Chambers*
Jourdan, Major Edward, *Harley-ſtreet*
Ives, Jeremiah, Eſq. *St. Clement's, Norwich*
Ives, Jeremiah, Eſq. *Cotton, near Norwich*

K.

* Kinnoull, Robert Drummond Hay Earl of
Kinnaird, George Lord, F. R. and A. S.
Keith, George Lord, *Cavendiſh-ſquare*, M. P.
Kaye, Rev. Sir Richard, Bart. Dean of Lincoln, LL. D. F. R. and A. S.
Kaye, Mr. Joſeph, Architect, *Saville-row*
Kappen, Mr. William, *Southampton-ſtreet, Strand*
Karr, Andrew Ramſay, Eſq. *Wimpole-ſtreet*
Keighley, James, Eſq. *Hertford-ſtreet, May-fair*
††Kendrick, Edward, Eſq. *King-ſtreet, Covent-garden*
Kent, Nathaniel, Eſq. *Windſor*
††Keyſall, John, Eſq. *Queen's-ſquare, Holborn*
Kidman, Mr. John, *Fleet-ſtreet*
King, the Rev. Richard, *Worthin, Shropſhire*
King, Mr. Thomas, jun. *Great Queen-ſtreet*
Kingſton, John, Eſq. *Stratford-place*
Kirkby, William, Eſq. *Exchequer-Office, Temple*
Knill, John, Eſq. *Gray's-inn*
Knight, Mr. George, *Cliffe, near Rocheſter*
Knubley, Richard, Eſq. *Bath*

L.

Loughborough, Alexander Lord, F. R. and A. S. Lord High Chancellor of Great-Britain
P Lanſdowne, the Moſt Noble the Marquis of
* Leiceſter,

* Leiceſter, George Earl of, F. R. S. and Preſident of the Society of Antiquaries

**Liverpool, Charles Earl of, V. P.

P Lewiſham, George Lord Viſcount, F. R. and A. S. and F. L. S.

Leiceſter, Sir John, Bart. M. P. *Piccadilly*

P Laurent, Sir Francis, Kt.

P Lewes, Sir Watkin, Kt. V. P. *Parliament-ſtreet*

P††Lambert, Charles, Eſq. F. A. S. *Temple*

Lambert, Aylmer Bourke, Eſq. F. R. and A. S. and F. L. S. *Lower Groſvenor-ſtreet*

Lambert, Anthony, Eſq.

Landman, Iſaac, Eſq. *Royal Academy, Woolwich*

Langton, Mr. Daniel, Builder, *Wandſworth*

P Larkins, William, Eſq. F. R. and A. S. *Blackhtath-point*

Law, Thomas, Eſq. *Abroad*

Lawrence, Richard, Eſq. *Mincing-lane*

Lawrence, Richard James, Eſq.

Leach, Mr. Edward, *Cotton Manufactory, Tottenham-court-road*

Lefevre, Charles Shaw, Eſq. M. P. *Bedford-ſquare*

Leader, William, Eſq. *Wandſworth*

††Leake William, Eſq. *Parliament-ſtreet*

Leatham, William, Eſq. *Chatham-ſquare, Blackfriars*

Leatham, Iſaac, Eſq. *Burton-le-ſtreet, Yorkſhire*

Lee, William, Eſq. *Alton, Herts*

Legh, George John, Eſq. *Pall-Mall*

††Leigh, John, Eſq. *Bedford-ſquare*

Lettſom, John Coakley, M. D. F. R. and A. S. *Baſinghall-ſtreet*

Levy, Moſes Iſaac, Eſq. F. A. S. *George-ſtreet, Hanover-ſquare*

††Lewis, Percival, Eſq. *Lincoln's-inn*

††Lewis, William, Eſq. F. L. S. *Holborn*

Lewis, Thomas, Eſq. *Great James-ſtreet, Bedford-row*

Lillingſtone, A. Spoone, Eſq.

Liptrap, John, Eſq. F. A. and L. S. *Whitechapel-road*

Llewellyn, John, Eſq. *Penllenganc, Glamorgan-ſhire*

P Lloyd, William, Eſq.

* Lock, William, Eſq. *Golden-ſquare*

P Long, Samuel, Eſq. M. P. *Hill-ſtreet, Berkeley-ſquare*

Longman, Mr. Thomas, *Cheapſide*

P Loveden, Edward Loveden, Eſq. M. P.

Lowndes, William, Eſq. *Scotland-yard, Whitehall*

Lowten, Thomas, Eſq. *Temple*

Lowth, Rev. Robert, *George-ſtreet, Hanover-ſquare*

Loxdale, Thomas, Eſq. *Braidley-Lodge, near Bilſon, Staffordſhire*

††Lumley, Mr. William, *Weſton-place, Pancras, or Chancery-lane*

† Lynd, James, Eſq. *Beaufort-buildings*

M.

* Macclesfield, George Earl of

* Morton, George Earl of, F. R. and A. S.

P Malmeſbury,

P Malmeſbury, James Lord, K. B. and LL. D.
Milford, Richard Lord, M. P.
Marſham, the Honourable Charles, M. P.
*P Monckton, the Honourable Edward, M. P. *Portland place*
Middleton, Sir Charles, Bart. M. P. *Hertford-ſtreet, May-fair*
Moleſworth, Sir William, Bart. *Pencarrow, Cornwall*
* Mac Pherſon, Sir John, Bart. M. P.
Morſhead, Sir John, Bart. M. P. *Hampton-court*
Monro, Sir Hugh, Bart. *Glouceſter-place, Portman-ſquare*
P Mackreth, Sir Robert, M. P. *Cork-ſtreet*
Macleod, Major-General Norman, M.P. F. R. S. *St. Alban's ſtreet*
Macdonald, John, M. D. *King-ſtreet, Soho*
M'Leod, John, Eſq. *Argyll-ſtreet*
†† Mac George, William, Eſq. *New Bond-ſtreet*
Macmurdo, Mr. Edward Longdon, *Bread-ſtreet*
P Macnamara, John, Eſq.
Mac Dougal, Mr. James, *No.* 418, *Oxford-ſtreet*
Mac Konochie, A. Lochart, Eſq. *Suffolk-ſtreet, Charing-croſs*
Magens, Dorrien, Eſq. *Cavendiſh-ſquare*
* Maitland, Ebenezer, Eſq. *Coleman-ſtreet*
Malcolm, Mr. Jacob, *Stockwell*
Malo, Mr. Joſeph, *Pavement, Moorfields*
Malton, James, Eſq. *Norton-ſtreet, Portland-place*
Manley, John George, Eſq. *Braziers, Oxon*
Mainwaring, Mr. Thomas, *Strand*

Marks,

Marks, Mr. John, Builder, *Princes-ſtreet, Hanover-ſquare*

Marriott, John Martin, Eſq. *Lamb's-Conduit-ſtreet*

Marſli, Mr. William, *South-ſtreet, Groſvenor-ſquare*

Marſhall, Andrew, M. D. *Thavies-inn*

Martin, James, Eſq. M. P. *Downing-ſtreet*

Martin, Matthew, Eſq. *Parliament-ſtreet*

Martyn, the Reverend Thomas, B. D. F. R. S. F. L. S. *Profeſſor of Botany, Cambridge, Frith-ſtreet, Soho*

Martin, Thomas, Eſq. *Great Marlborough-ſtreet*

††Maſkall, Samuel, Eſq. *Mitre-court, Milk-ſtreet*

Matthews, Edward, Eſq. *Sol's-row, Tottenham-court-road*

Mayor, Mr. Joſeph, *Little Moorfields*

Mayhew, John, Eſq. *Broad-ſtreet, Carnaby-market*

Meares, John, Eſq. *Park-lane*

Meheux, John, Eſq.

* Melville, General Robert, F. R. and A. S. *Brewer-ſtreet*

††Meredith, William, Eſq. *Harley-place*

Meredith, George, Eſq. *ditto*

Merry, William, Eſq. *Gower-ſtreet*

Metcalfe, Chriſtopher Barton, Eſq. *Weſt-Ham*

Meux, Richard, jun. Eſq. *Liquor-pond-ſtreet*

††Meyrick, John, Eſq. F. A. S. *Great George-ſtreet*

Meyrick, Owen Patland, Eſq. *Bodalgan, Angleſey*

††Michell, Mathew, Eſq. *Beaufort-buildings, Strand*

Middleton, John, Eſq. *Lambeth*

Midford, George, M. D. *Weſt-ſquare, Lambeth*

††Mildred,

††Mildred, Daniel, Esq. *White-hart-court, Grace-church-street*
Miles, Mr. John, *Birmingham*
Millikin, Mr. Hallay Benson, *Whitechapel*
Millington, Langford, Esq. *Tooting, and Berners-street*
Millington, Mr. Thomas, *Golden-square*
P Mills, Abraham, Esq. *Fence-house, Macclesfield*
Mills, Mr. George, *Old Swan-stairs*
Mills, Samuel, Esq. *Finsbury-place*
Miller, John, Esq. *Red-lion-square*
Milnes, Richard Slater, Esq. M. P. *Foiston, near Ferrybridge, Yorkshire*
Minier, Mr. William, *Strand*
Minier, Mr. Charles, *ditto*
Minish, Mr. William, *Whitechapel*
Mist, Mr. Henry, *Long-acre*
Mitchel, Michael, Esq. *Walthamstow*
Mitchel, William, Esq. M. P. *Devonshire-place*
Mitford, Robert, Esq. *Great Portland-street*
Montresor, John, Esq. *Harley-street*
Montolieu, Lewis, Esq. F. A. S.
* Montagu, Mrs. Elizabeth, *Portman-square*
Morley, William, Esq. *New Broad-street*
Morse, Leonard, Esq. F. R. S. and S. A. *Great George-street, Westminster*
Morris, Mr. William, *Whitcombe-street*
Mortimer, Charles, Esq. *Conduit-street*
Morton, Thomas, Esq. *John-street, Adelphi*
Mosely, Walter Michael, Esq. *near Worcester*

Moser,

Moſer, Mr. John, *Frith-ſtreet, Soho*
Munn, Daniel Rolfe, Eſq. *Hammerſmith*
Murrey, John, M. D. *Bedford-ſtreet, Bedford-ſquare*

N.

P Norfolk, Charles Duke of, Preſident, F. R. and A. S.
**Northumberland, Hugh Duke of, V. P. K.G. F. R. and A. S.
††Northampton, Charles Earl of
Northeſk, William Earl of
Naghton, Thomas, M. D.
Naſh, Mr. Thomas, *Worceſter*
Naſh, John, Eſq. *Dover-ſtreet*
Neale, Mr. Thomas, jun. *Beaumont-ſtreet, Cavendiſh-ſquare*
Newbury, Benjamin, Eſq. *Ely-place*
Newbury, Jacob, Eſq. *New Inn*
Newcombe, Mr. William, *Bank*
Newnham, the Rev. William Moore, *Boyle-ſtreet, Saville-row*
P Newton, Robert, Eſq. *Norton-houſe, Berks*
P Newton, Andrew, Eſq. *Cecil-ſtreet, Strand*
Newton, Mr. John, *Lamb's-Conduit-ſtreet*
De Neyva, Joſeph da Cunha Para, Eſq. *Artillery-place*
Nichols, John, Eſq. *Red-Lion-paſſage, Fleet-ſtreet*
Nicolay, Frederick, jun. Eſq. *St. James's Palace*
† Nicol, George, Eſq. *Pall-mall*

Noble,

Noble, William, Esq. *Pall-mall*
Nouaille, Peter, Esq. *Greatness, Kent*
Noireterre, Mademoiselle de, *Paris*
Norman, Robert, Esq. *Cannon-street*
Northey, William, Esq. *Queen-street, May-fair*
Nutting, Mr. Joseph, *King-street, Covent-garden*

O.

P Ossory, John Earl of Upper, F. R. and A. S.
Ogilvie, Scroope, Esq. *Pall-mall*
Ogle, Mr. Thomas, *Abroad*
Oldham, John, Esq. *Sackville-street*
Oliver, the Rev. John, *Croombs-hill, Blackheath*
Ord, John, Esq. F. R. and A. S. *Lincoln's-inn-fields*
Orrell, Thomas, Esq. *Winsley-street, Oxford-street*

P.

**Portland, William Henry Duke of, V.P. K. G. F. R. and A. S.
P Plymouth, Otho Earl of, F. R. and A. S.
P Petre, Lord
**Pitt, the Right Honourable William, M. P.
Pelham, the Right Honourable Thomas, M. P. *Stratton-street*
* Pusey, Honourable Philip, *Upper Brook-street*
Pulteney, Sir William, Bart. M. P. *Bath-house*
Packer, Mr. William, *King-street, Soho*
Page, Francis, Esq. M. P. *Ashton, Oxfordshire*

Page,

Page, Francis, Eſq. *Newbury, Berks*
Page, Frederick, Eſq. *Serjeant's-inn, Fleet-ſtreet*
Page, Mr. John, *High Holborn*
P Paice, Mr. Joſeph, *Bread-ſtreet-hill*
Pakenham, Captain Edward, R. N.
Papworth, Mr. Thomas, *Great Portland-ſtreet*
Park, Mr. James, *Baldwin's gardens*
† Parkes, Richard, Eſq. *Broad-ſtreet, Bloomſbury*
Parkins, Mr. William, *Adelphi Wharf*
Parker, David, Eſq. *King's Mews*
Parker, Mr. William, *Fleet-ſtreet*
††Parker, Mr. Samuel, *Bridge-ſtreet, Blackfriars*
Parker, Mr. Thomas, *Fleet-ſtreet*
Parker, Samuel Walker, Eſq. *White Lead Works, Newcaſtle-upon-Tyne*
Parkinſon, Mr. Thomas, *Bloomſbury-market*
Parnell, Mr. Hugh, *Church-ſtreet, Spitalfields*
Parry, Mr. Edward, *Newgate-ſtreet*
Parry, William, Eſq. *Norton-hall, Wiltſhire*
Parſon, Pearce, Eſq. *Doctors-commons*
Paterſon, William, Eſq. *Devonſhire-place*
Paxton, William, Eſq. *Queen-ſquare, Holborn*
Paxton, Mr. Chriſtopher, *Alderſgate-ſtreet*
††Payne, Samuel, Eſq. *Vauxhall*
Peacock, Mr. Lewis, *Lincoln's-inn-fields*
Pearce, William, Eſq. *Craig's-court*
††Pearſon, James, Eſq. *Baſinghall-ſtreet*
Peel, Robert, Eſq. M. P. *Bury, Lancaſhire*
Peirſon, Peter, Eſq. F. R. and A. S. *Inner Temple*

Pelerin,

Pelerin, Henry Ferdinand, Eſq. *No. 7, Lower James-ſtreet, Golden-ſquare*

Penruddock, Charles, Eſq. *Soho-ſquare*

Penton, Mr. George, *New-ſtreet-ſquare, Shoe-lane*

P Perin, William Philip, Eſq. F. R. and A. S. *Bloomſbury-ſquare*

Perring, John, Eſq. Alderman, *New Broad-ſtreet*

Perry, John, Eſq. *Blackwall*

Perry, James, Eſq. *Strand*

Perrott, George, Eſq. *Craycombe-houſe, Worceſterſhire*

Petrie, William, Eſq. M. P. F. R. and A. S. *Hertford-ſtreet, May-fair*

Petrie, John, Eſq. M. P. *Portland-place*

P Pettiward, Roger, Eſq. *St. James's-ſtreet*

Phillips, John, Eſq. *Ely*

Phillips, Mr. Samuel, *St. George's road, Blackfriars-bridge*

Phillips, Mr. Richard, *St. Paul's Church-yard*

Phillipſon, Thomas, Eſq. *Harpur-ſtreet*

Pickering, Mr. Robert

Pigou, William, Eſq. *Portland-place*

Pitt, William Morton, Eſq. M. P. and F. R. S. *Arlington-ſtreet*

P††Pitt, Thomas, V. P. F. A. S. *Wimpole-ſtreet*

Planta, Joſeph, Eſq. F. R. S. *Britiſh Muſeum*

Pocock, Charles, Eſq. *Sowley, in the County of Southampton*

Pollen, George Auguſtus, Eſq. M. P. *Hill Houſe, Leatherhead*

Pollett, Mr. Robert, *North Weald, near Epping*

Pontopidian,

Pontopidan, Charles, Esq. *Copenhagen*
Pope, William, Esq. *Hillingdon, Middlesex*
P Portman, Edward Berkeley, Esq. *Bryanston, near Blandford, Dorset*
Porter, William, Esq. *Copthall-court, Throgmorton-street*
Pote, Edward Ephraim, Esq. *East-Indies*
P Potter, Christopher, Esq. *Abroad*
Potter, George, Esq. *Charing-cross*
Pourcin, Mr. Joseph, *No.* 143, *Tottenham-court-road*
Powell, David, jun. Esq. *Little St. Helen's*
Powell, John Clark, Esq. *ditto*
††Powell, Arthur Annesly, Esq. *Devonshire-place*
Powlett, William Powlett, Esq. M. P. *Sambourne, near Stockbridge*
Powney, Henry, Esq. *Lamb's-Conduit-street*
P Prado, Samuel, Esq.
Praed, William, Esq. M. P. *Tyringham, Bucks*
Pratt, John, Esq. *Lower Brook-street*
Preston, Mr. Thomas, *Strand*
Pricket, Thomas, Esq. *Wanstead, Essex*
Pringle, Mark, Esq. M. P. *Conduit-street*
Prinsep, John, Esq. *Pall-Mall*
Pryce, Benjamin, Esq. *Bath*
Pugh, David Heron, Esq. *King-street, Cheapside*

Q.

* Queensberry, William Duke of, K. T.

R.

**Richmond, Charles Duke of, V. P. K. G. F. R. and A. S.
**Radnor, Jacob Earl of, V. P. F. R. and A. S.
**Romney, Charles Lord, V. P. and F. R. S.
* Roſebery, Niel Earl of, K. T.
††P Rancliffe, Thomas Boothby Lord, V. P. M. P. F. R. and A. S.
Ruvo, Ettore Carrafa, Count
* Ryder, the Right Honourable Dudley, M. P.
††Ridley, Sir Matthew White, Bart. M. P. *Portland-place*
††Raby, Alexander, Eſq. *Broad Sanctuary*
Roe, John, Eſq. *Angel-court, Throgmorton-ſtreet*
P Ramey, John, Eſq. *Ormeſby, Norfolk*
††Ramſbottom, John, Eſq. *Alderſgate-ſtreet*
††Ramſbottom, Richard, Eſq. *ditto*
Raſtrick, Mr. John, *Morpeth*
Rawlinſon, Abraham, Eſq. *Lancaſter*
Rawlinſon, Thomas, Eſq. *ditto*
Reaſton, Francis Buſhell, Eſq. *Queen Anne-ſtreet Weſt*
††Read, John, Eſq. *Great James-ſtreet, Bedford-row*
Read, Colonel Henry, *Lower Seymour-ſtreet*
Rehe, Mr. Samuel, *Shoe-lane*
Rees, the Rev. Abraham, D. D. F. R. S. *Hackney*
Reeves, John, Eſq. F. R. and A. S. *Cecil-ſtreet, Strand*

Reeves, Mr. William, *Strand*

Reid, Mr. John, *Fan-ſtreet, Alderſgate-ſtreet*

††Reid, Andrew, Eſq. *Whetſtone, Middleſex*

† Reid, John, Eſq. *Bedford-ſquare*

††Remington, John, Eſq. *Milk-ſtreet, Cheapſide*

Rennie, Mr. John, *New-road, Blackfriars*

Reynolds, Major Thomas Vincent

Riddell, Colonel John, *Weymouth-ſtreet*

Ring, Thomas, Eſq. *Reading, Berks*

Ritſon, Thomas, Eſq. *Ingram-court, Fenchurch-ſtreet*

Rivier, Philip, Eſq. *Lawrence-Poultney-lane*

Roberts, Rev. William Hancock, D. D. *Loughborough Houſe*

Robertſon, William, M. D. *Golden-ſquare*

Robertſon, James, M. D. F. R. S. *Ibbetſon's Hotel*

Robinſon, Samuel Wakefield, Eſq. *Vere-ſtreet, Cavendiſh-ſquare*

††Robinſon, George, Eſq. *Harpur-ſtreet*

P Robinſon, Thomas, Eſq. *Vere-ſtreet, Cavendiſh-ſquare*

Robins, Mr. John, *Warwick-ſtreet*

Robley, John, Eſq. *Stoke Newington*

† Robſon, James, Eſq. High Bailiff of the City of Weſtminſter, *Conduit-ſtreet*

Rodes, Cornelius Heathcote, Eſq. *Balborough, Derbyſhire*

Rogers, Samuel, Eſq. F. R. S. *Paper-Buildings, Temple*

Rondeau, James, Eſq. *No. 3, Shorter's-court, Throgmorton-ſtreet*

Roope,

Roope, John, Eſq. *Yarmouth*
Roſe, George, Eſq. M. P. *Old Palace-yard*
Roſe, George Henry, Eſq. *ditto*
P Roſs, Colonel Patrick, F. R. and A. S. *Harley-ſtreet*
Rowcroft, Thomas, Eſq. *Lawrence-Poultney-lane*
Rowntree, Mr. Thomas, *Great Surry-ſtreet, Black-friars*
Rucker, Daniel Henry, Eſq. *Broad-ſtreet, City*
Ruddle, Francis, Eſq. *Queen's-ſquare, Bloomſbury*
Ruffo, Monſieur Vincent, *Naples*
Ruggles, Thomas, Eſq. F. A. and L. S. *Clare, Suffolk*
Runqueſt, Peter Andrew, Eſq. *Bury-court, St. Mary Axe*
P Ruſſel, Jeſſe, Eſq. *Goodman's-fields*
Ruſſel, John, Eſq. R. A. *Newman-ſtreet*
Ruſſel, William, Eſq. *Berwick, Northumberland*

S.

* Shrewſbury, Charles Earl of
P Suffolk, John Earl of
P Shafteſbury, Anthony Earl of, F. R. and A. S.
Scarborough, George Auguſtus Earl of
P Stanhope, Charles Earl of, F. R. S.
St. Vincent, John Earl
P Scarſdale, Nathaniel Lord
Stuart, the Honourable Charles, M. P.

P St. Aubyn, Sir John, Bart. F. R. and A. S. *Stratford-place*

Sheffield, Sir John, Bart. *Portland-place*

Smith, Sir John, Bart. F. R. and A. S. *Sydling, Dorsetshire*

††Sinclair, Sir John, Bart. M. P. F. R. and A. S. *Whitehall*

††Staunton, Sir George Leonard, Bart. LL. D. F. R. and L. S. *Devonshire-street*

Stephens, Sir Philip, Bart. M. P. F. R. and A. S.

††Smith, Sir Sidney, Kt. Capt. R. N. Commander Grand Cross of the Order of the Sword

††Smith, Major-General Edward

St. Barbe, John, Esq. *Seething-lane*

Sadler, Jonathan, Esq. *King's-arms yard, Coleman-street*

† Salte, William, Esq. *Poultry*

Sanders, John, Esq. *Mortlake, Surry*

Sanfom, Philip, Esq. *Fenchurch-street*

Sargeaunt, Mr. John, *Great Queen-street*

Satterthwaite, Mr. John, *Mincing-lane*

Savage, Thomas, M. D. *Conduit-street*

Savage, Mr. James, *Great Queen-street*

Saunders, Thomas, Esq. *Haydon-square, Minories*

Saunders, Mr. George, F. A. S. *Oxford-street*

P Saunders, Mr. Edward Grey, *Edgware-road*

Saxon, Mr. Samuel, *Parliament-street*

Sayer, Thomas, Esq. *Bow, Middlesex*

Sayer, Henry J. Esq. *Lincoln's-inn*

Schaw, Lieutenant-Colonel John B. *Queen-Ann-street East*

Scholey,

Scholey, Mr. George, *Old Swan-ſtairs*
P Scott, David, Eſq. *Devonſhire-place*
Scott, Robert, Eſq. *Groſvenor-ſquare*
Scott, Hugh, Eſq. *Harley-ſtreet, Cavendiſh-ſquare*
Scott, Mr. Thomas, *Ludgate-hill*
††Seale, Mr. David, *Peckham*
Seddon, Mr. Thomas, *Alderſgate-ſtreet*
P Selby, Henry Collingwood, Eſq. *Twickenham-common, Middleſex*
Serra, Iſaac, Eſq. *King's-road, Gray's-inn-lane*
Sewell, Mr. John, *Cornhill*
Sewell, the Reverend George, *Byfleet, near Ripley, Surrey*
Sewell, Mr. George, *London-ſtreet, Fitzroy-ſquare*
Shadwell, Henry, Eſq. *Beverley, Yorkſhire*
P Shakeſpeare, Mr. George, *Oxford-ſtreet*
††Sheldon, Thomas, Eſq. F. R. S. *Tottenham-court-road*
Sheldrake, Mr. Timothy, *Strand*
Shelley, Samuel, Eſq. *George-ſtreet, Hanover-ſquare*
††Sheplee, Richard, Eſq. *Horſlydown*
Sherſon, Robert, M. D. F. A. S. *New Bridge-ſtreet, Blackfriars*
Shiffner, Godin, Eſq. *Weymouth-ſtreet, Portland-place*
P Shipley, Mr. William, Gent. *Maidſtone, Kent*
P Shore, Samuel, Eſq. *Norton-hall, Derbyſhire*
P Shore, Samuel, jun. Eſq. *Lincoln's-inn*
Sibley, Joſeph, Eſq. *Market-ſtreet, Herts*
Simpſon, Mr. Thomas, *Chelſea Water-works*

Simpken, Mr. Charles, *Oxford-ſtreet*
Simpkin, Mr. Thomas, *Strand*
Skinner, Thomas, Eſq. Alderman, *Alderſgate-ſtreet*
Skinner, William, Eſq. *Finſbury-ſquare*
P Skottow, Nicholas, Eſq. *Berners-ſtreet*
Slade, John, Eſq. *Hammerſmith*
Slade, John Moore, Eſq. *Chatham*
Smart, Mr. George, *Camden Town*
Smirnove, Rev. James, *Upper Mary-le-bone-ſtreet*
* Smith, George, Eſq.
† Smith, John Spencer, Eſq.
†† Smith, William, Eſq. *Lombard-ſtreet*
Smith, William, Eſq. M. P. *Park-ſtreet*
Smith, Mr. John, *Lad-lane*
†† Smith, Joſhua, Eſq. M. P. *Great George-ſtreet, Weſtminſter*
Smith, Simmons Smith Joſhua, Eſq. *Batterſea, and Lamb's-conduit-ſtreet*
Smith, Mr. Dedrick, *Gerard-ſtreet*
* Smith, Mr. Nathan, *Knightſbridge, Brighthelmſtone*
Smith, Captain William, of the Royal Navy
Smith, Henry, Eſq. *Drapers-hall*
Smith, Mr. Richard, *Crown-court, Cheapſide*
Smith, Mr. Edward, *Broad-ſtreet, City*
†† Smith, George, Eſq. *Lombard-ſtreet*
Smith, Eaglesfield, Eſq. *Great Queen-ſtreet*
Soane, John, Eſq. F. A. S. *Lincoln's-inn-fields*
Soley, Mr. Thomas Apreece, *Bloomſbury*

Songa,

Songa, Anthony, Esq.
† Sparks, Robert, Esq. *St. John's street*
Sparkes, Joseph, Esq. *Red-lion-square*
Sparrow, Robert, Esq. *Portland-place*
Spiller, James, Esq. *Guildford-street*
Spilsbury, Mr. William, *Snowhill*
Spilsbury, Mr. Charles, *ditto*
Splitgerber, Mr. John Christian, *Church-court, Walbrook*
Splitgerber, Mr. Frederick, *ditto*
Spottiswood, John, Esq. *Sackville-street*
Spurrier, Mr. Isaac, *Greek-street, Soho*
Stafford, Robert, Esq. Banker, *Huntingdon*
Standen, the Reverend J. H. Rector of Murston, *Kent*
Stanhope, Walter Spencer, Esq. *Upper Grosvenor-street*
Stanley, George, Esq. *Ponsonby-hall, Cumberland*
Stanley, John, Esq. *Berners-street*
Steell, Robert, Esq. *Finsbury-square*
Steer, Charles, Esq. *Church-street, Spitalfields*
P†† Steers, John William, Esq. F. A. S. *Inner Temple*
P Steers, James, Esq. *Middle-Temple*
*†† Stephens, Francis, Esq. F. R. and A. S. V. P. Commissioner of the Victualling Office
Stephens, James, Esq. *Camerlton-house, near Bath*
Stevenson, Thomas, M. D.
Stevenson, James, M. D. *Lower John-street, Golden-square*

Stiff, Mr. Thomas, *New-ſtreet, Covent-garden*
Still, Mr. Samuel Stanford, *Bankſide, Southwark*
Stockwell, John, Eſq. *Crutched-friars*
Stockdale, Mr. Jeremiah, *Holborn*
Stodart, William, Eſq. *Golden-ſquare*
Stone, Mr. Thomas
††Stone, William, Eſq. *Old Ford, Middleſex*
Stonard, Nathaniel, Eſq. *Bow, Middleſex*
Storey, Robert, Eſq. *Bedford-ſquare*
Strachan, James, Eſq. *Mincing lane*
††Strange, James, Eſq. M. P. *Hertford-ſtreet, Mayfair*
Street, Mr. James Wallis, *King-ſtreet, Bloomſbury*
Stuart, Andrew, Eſq. M. P. and F. A. S. *Lower Groſvenor-ſtreet*
Suart, George, Eſq. *Lancaſter*
P Sulivan, Richard Joſeph, Eſq. M. P. F. R. and A. S.
Sulivan, John, Eſq. M. P. *Arlington-ſtreet*
Sumner, George, Eſq. M. P. *George-ſtreet, Weſtminſter*
Sykes, Mark Maſterman, Eſq.
Symmons, John, Eſq. F. R. A. S. and L. S. *Paddington-houſe*
Syms, George William, Eſq. *Southampton-buildings*

T.

**Thanet, Sackville Earl of
Tabrum, Mr. Robert, *Gracechurch-ſtreet*
Taitt, William, Eſq. *Cardiff*

P Talbot,

P Talbot, Thomas Manſel, Eſq. *Penrie-caſtle, Glamorganſhire*

Tanner, William, Eſq. *Monmouth and Queenhithe*

††Tate, William, Eſq. *Pimlico*

Tatham, Thomas, Eſq. *Mount-ſtreet, Groſvenor-ſquare*

Taylor, William, Eſq. M. P.

Taylor, William, Eſq. *Charlotte-ſtreet, Bedford-ſquare*

Taylor, John, Eſq. *Hatton-garden*

Taylor, Mr. Joſiah, *Holborn*

P Teixiera, Abraham David, Eſq. *Mincing-lane*

Tekell, John, Eſq. *Lamb's-buildings, Temple*

Templer, James, Eſq. *Stover-lodge, Devon*

Thomas, David, Eſq. *Pay Office, Horſe Guards*

Thomſon, the Rev. Robert, D. D. *Kenſington*

Thomſon, Alexander, Eſq. *Somerſet-ſtreet*

P Thompſon, William, Eſq. *Leeds, Yorkſhire*

Thompſon, Mr. George, *Duke-ſtreet, York-buildings*

Thompſon, Mr. John, *Duke-ſtreet, York-buildings*

Thomſon, Mr. Joſeph, *Vine-ſtreet, Piccadilly*

P Thornton, Samuel, Eſq. M. P. *Clapham*

Thornton, William, Eſq. Colonel in the 1ſt Regiment of Foot Guards, *Park-lane*

Tildeſley, Thomas, Eſq. *Hampton-court*

Tillock, Alexander, Eſq. *Carey-ſtreet*

Thoyts, William, Eſq. *Southamſtead, Berks*

Timſon, William, Eſq. *Tooting*

Tod, William, Eſq. *Dean-ſtreet, Soho*

Tomkiſon, Thomas, Eſq. *Dean-ſtreet, Soho*

Tomlins,

Tomlins, Mr. Thomas, *Lambeth Marſh*
Topham, Edward, Eſq. *Weymouth-ſtreet*
Totton, Stephens Dinely, Eſq. A. M. *abroad*
Towne, Mr. Francis
†† Towry, George Philips, Eſq. Commiſſioner of the Victualling Office
P Travers, Mr. Joſeph, *Swithin's-lane*
Trenchard, John, Eſq. *Welbeck-ſtreet*
Treſham, Henry, Eſq. *George-ſtreet, Hanover-ſquare*
Trevelyan, Walter, Eſq. *Morpeth, Northumberland*
Trotter, John, Eſq. *Soho-ſquare*
Trotter, Coutts, Eſq. *Strand*
Trotter, Captain John, *Wimpole-ſtreet*
P Tunſtall, Marmaduke, Eſq. F. R. and A. S. *Wycliffe, Yorkſhire*
P Turnbull, John, Eſq. F. R. and A. S. *New Broad-ſtreet*
Turner, Charles H. Eſq. *Limehouſe*
Turner, Thomas, Eſq. *Caughley-place, near Sheffnall, Shropſhire*
P Turner, John Frewen, Eſq. *Cold Overton, Leiceſterſhire*
P Tyers, James, Eſq. *Little Eaſtcheap*
Tytler, Henry William, M. D. *Titchfield-ſtreet*

U.

P Uxbridge, Henry Earl of, F. A. S.
Udny, Robert, Eſq. F. R. and A. S. *Teddington*
Upton, Charles, Eſq. *Derby*

V.

V.

P Valencia, Richard Lord Viſcount, F. L. S.
Vernon, George Venables Lord, *Park-place*
Veltheim, his Excellency Baron
Valangin, Francis, M. D. *Hermes-hill*
Valpy, the Rev. Richard, D. D. and F. A. S. *Reading, Berks*
Vandercomb, Joſeph Fitzwilliam, Eſq. *Buſh-lane, Cannon-ſtreet*
Vaughan, Benjamin, Eſq.
Vaughan, William, Eſq. *Mincing-lane*
†† Vernon, John, Eſq. *Bedford-ſquare*
Vidal, Emeric, Eſq. *Brentford*
Vidler, Mr. John, *Milbank, Weſtminſter*
Vigne, Stephen James, Eſq. *Margaret-ſtreet, Weſtminſter*
Vivian, John, Eſq. *Gray's-inn*

W.

P Warwick, George Earl of, F. R. and A. S.
P Winchelſea, George Earl of, F. A. S.
* Williams, Sir Edward, Bart.
P Webb, Sir John, Bart. F. R. and A. S.
P Willes, Sir Francis, Kt. *Cheſterfield-ſtreet*

Wynne,

Wynne, the Right Hon. Sir William, LL. D. F. R. and A. S. *Doctors-commons*
Wadd, William, Esq. *Basinghall-street*
††Wade, George, Esq. *Southampton-row, Bloomsbury*
Waddington, William, Esq. *Chatham-place*
Waistell, Mr. Charles, *High Holborn*
Wakefield, Mr. Edward, jun. *Old Jewry*
††Walcot, William, Esq. F. A. S. *Inner-Temple*
P Wale, Gregory, Esq. *Shelford, near Cambridge*
Walker, John, Esq. F. R. and A. S. *Gower-street, Bedford-square*
Walker, John, Esq. *Argyll-street*
Walker, Thomas, Esq. *Woodstock, Oxon*
Walker, Mr. Daniel, *Great Pulteney-street*
Walker, Mr. Thomas, *Epsom*
Walker, Thomas, Esq. *King-street, Golden-square*
Walker, Thomas, Esq. *Croydon*
Walker, Joshua, Esq. *Rotherham*
Waller, Charles, Esq. *West Wickham, Kent*
Waller, William, Esq. *Charles-street, Cavendish-square*
Wallis, George, M. D. *Red-lion-square*
Wansey, Mr. John, *Lothbury*
Wansey, Mr. George, *Warminster, Wilts*
Warburton, the Rev. W. P. *Lambeth House*
P Ward, Mr. John, *Air-street, Piccadilly*
P Ward, Ralph, Esq. *Great Portland-street*
Ward, John, Esq. *Ludgate-street*
P Waring, Richard Hill, Esq. F. R. S. *Inner Temple*
Waters, Mr. Edward, *George-street, York-buildings*

Watkins,

Watkins, Walter, Esq. *Groyney Works, near Abergavenny*
Watts, John, Esq. *Thames-street*
P Wedgwood, John, Esq. F. L. S. *Devonshire-place*
Wedgwood, Josiah, Esq. *Etruria, Staffordshire*
Wedgwood, Thomas, Esq. *ditto*
Wells, Richard Strong, Esq. *Ely Place*
Wenman, Charles, Esq. *Symond's-inn*
P †† West, Thomas Thompson, Esq. *Crown-court, Cheapside*
†† West, Benjamin, Esq. President of the Royal Academy, and F. A. S. *Newman-street*
Westcot, George, Esq. *Chelmsford*
Westmacott, Mr. Richard, *Mount-street, Grosvenor-square*
Weston, John Webbe, Esq. *Sutton-place, near Guildford*
Weymouth, Henry, Esq. *Battersea*
Whipham, Mr. Thomas, *Fleet-street*
White, Thomas, Esq. *Retford, Nottinghamshire*
†† White, John, Esq. *Mary-le-bone*
White, William Wood, Esq. *Walthamstow*
P White, Rev. Stephen, LL. D.
†† Whitefoord, Caleb, Esq. F. R. and A. S. *Adelphi*
Whitefoord, J. R. Esq. *Gloucester-place, Portman-square*
P Whitefield, Henry Fotherby, Esq. *Rickmansworth, Herts*
Whitehead, George, Esq. *Basinghall-street*
Whyte, John, Esq. *Brewer-street*

Wilberforce,

Wilberforce, William, Esq. M. P. *Palace-yard, Westminster*

Wilde, James, Esq. *Thames-street*

Wilkins, Jeffery, Esq. *Brecon*

††Wilkinson, John, Esq. *Brymbo, Denbeighshire*

P Wilkinson, William, Esq. *Bersham, near Wrexham*

Wilkinson, Mr. Thomas, *Charles-street, Covent-garden*

Wilkinson, Mr. Charles Hemming, *Nassau-street, Soho*

Williams, George Griffies, Esq. *Caermarthen*

††Williams, Thomas, Esq. M. P. *Llanidan, Anglesea*

Williams, Mr. Nicholas, *Suffolk-street*

Williamson, General Adam

P††Willis, William, Esq. *Lombard-street*

P*Willis, Dr. Robert, *Tenterden-street, Hanover-square*

Willet, John Willet, Esq. F. R. and A. S. *Berners-street*

††Willock, John, Esq. *Golden-square*

††Wilson, George, Esq. *Bedford-street, Covent-garden*

Wilson, Mr. Edward, *Strand*

Wilson, Thomas, Esq. *Navy Pay-Office, Somerset-house*

Wilson, Thomas, Esq. F. L. S. *Gower-street*

Wilson, Matthew, Esq. *Red-lion-square*

Wilson, Joseph, Esq. *Milk-street*

Wilsonne, Mr. William, *Basinghall-street*

Winder, Mr. John, *Shell Farm, Lenham, Kent*

Winsloe, Mr. Thomas, *Fulwell-lodge, Twickenham*

P Winne, Captain Isaac Lascelles, *Philpot lane, Fenchurch-street*

Winter,

Winter, George, Esq. *Charlton, near Bristol*
Wise, Matthew Blacket, Esq.
Wisset, Robert, Esq. *India-house*
Wood, George, Esq. *New Broad-street-buildings*
Wood, John, Esq. *Cardiff*
Wood, William, Esq. *Cork-street*
Wood, John, Esq. *North-Cove, Yorkshire*
Woodfall, Mr. George, *Paternoster-row*
Worthington, Thomas, G. Esq. *Jefferies-square, St. Mary Axe*
P Wotton, William Samuel, Esq.
††Wright, Nathaniel, Esq. *Hatton-street*
††Wright, Peter, Esq. *New Ormond-street*
Wright, Mr. John, *Lombard-street*
Wright, Mr. William, *Strand*
Wright, Joseph, Esq. *Stoke Newington*
Wrighte, Rev. Thomas William, A. M. F. A. S. *Somerset-place*
Wyatt, Edgell, Esq. *Inner Temple*
Wyatt, Samuel, Esq. *Albion Mills*
Wyatt, John, Esq. *Arundel-street*
Wyatt, James, Esq. R. A. *Queen Ann-street West*
††Wynne, John, Esq. *Fig-tree-court, Temple*
Wynne, John, Esq. *Southampton-buildings, Chancery-lane*
††Wyndham, Thomas, Esq. M. P. *Dunraven, Glamorganshire*

Y.

††Young, Sir William, Bart. M. P. F. R. and A. S.
Young, Mr. Lake, *Watling-street*

P Young,

P Young, Arthur, Esq. F. R. S. &c. *Bradfield-hall, Suffolk*

Young, Samuel, Esq. F. R. and A. S. *Bedford-square*

Young, Mr. Thomas, *Little Britain*

Z.

Zenobio, Right Honourable Count Alvise

P Zachary, John, Esq. F. A. S. *Arely, Worcestershire*

Corresponding Member elected since the last Publication.

Mr. ROBERT HYNAM, Peterſburgh.

INDEX.

A.

	Page
ACORNS, premiums offered for planting	4
AGRICULTURE, premiums in	4
Papers in	117
ALDER, premiums for	16
ANNATTO, premiums for	107
APPLES, ſome kinds loſt	264
Names of various ſorts	270
ARABLE LAND, premium for aſcertaining the component parts of	36
ASH, premiums for raiſing	17
ASHES, various, uſe of as Manures	232

B.

BALCARRAS, Lord, certificate ſigned by	356
BARILLA, premium for	53
BARLEY, account of Crops of, on improved Land	198
BARRY, James, Eſq. preſent to	365
BEAN, a, to bear late ſowing, much wanted	155

BEANS and WHEAT, premiums for 29
Premium adjudged for 144
Account of Culture of 146
Produce of, 147, et ſeq.
Expence of Culture 152
BELL, Mr. Robert, premium to 166, 363
Difference of ſoils on his land 184
How aſſiſted in his work 185
BEQUEST, form of, recommended 115
BREAD-FRUIT TREES, method of cultivating 357
BLIGHT, premiums for preventing 25
taking off ill effects of 26
Paper on the cauſe of 263, 279
What owing to 274, 275
BOLTS, driving into ſhips, premium for 89
BORER, premium for deſtroying 103
BOTANIC GARDEN, premium for 104
BREAD-FRUIT, premiums for 100
Paper on plantations of 355
Tree, how cultivated 357
BUCKNALL, T. S. D. thanks to 263
BUNN, James, certificate ſigned 164

C.

CABBAGES, property of 136
CAMPHIRE, its action on Cobalt 291
CATERPILLARS. (See Hops)
CHEMISTRY, premiums in 53
CHESNUTS, premiums for 8
CINNAMON, premiums for 98

COLONIES and TRADE, paper in 355
CLAY, Buſts in, hardened 303
CLOCK-MAKERS, Machine for the uſe of 308
CLOCKS, Crank Eſcapement for 327
Advantages of 329
Plate of 333
CLOTH from Hop-ſtalks, premium for 84
CLOVES, premiums for 99
COCKCHAFER, premium for deſtroying 46
COCHINEAL, premium for 108
COLONIES and TRADE, paper in 353
COLONIES, premiums for advantage of 97
COMPOSITION for producing Lights in Drawings 297
Mode of uſing 298
CONDITIONS for planting 23
to Polite Arts 80
General 111
COOK, Mr. bounty to 335, 366
COPAL, methods of diſſolving 268, 290, 292
Cautions concerning 289
CORN, harveſting in wet weather, premium for 34
Machine for mowing, premium for 45
COTTON, premium for 106
COUNTIES, premiums for Surveys of 77
CRAUFURD, Miſs C. M. Silver pallet to 365
CUTTERS for Wheels, proportions for 316, 322, 323

D.

DE SALIS, Reverend Dr. Silver Medal to 256, 362
DICKINSON, William, certificate ſigned 157
DIRECTIONS to Candidates 110

DRILL ROLLER, described 134
a hand, described 150
DUDGEON, Mr. Robert, premium to 144, 361
DYE, black, on Cotton, premium for 68

E.

EAST INDIES, premiums for the advantage of the 106
ECCLESTON, Thomas, Esq. Letter on making Hay 230
ELKINGTON, Mr. his manner of draining 204
ELM, premiums for raising 10

F.

FARMS, His Majesty's, in Windsor Park 119
Observations on 138
Flemish, how managed 135
FARM-YARD DUNG, a Manure 237
FARMER, W. B. M. certificate signed 229
FEATHERS, clearing of their oil, premium for 59
FEATHERSTONHAUGH, Mr. Wm. Silver Medal to 338, 347
FIR, Silver, premiums for raising 13
FORSTER, Matthew, Esq. Gold Medal to 240, 363
FOX, Mr. John, premium to 216, 363
Account of Land improved by 216, 225

G.

GAUGING CUTTERS, plates of instrument for 325
GLAZING without Lead, premium for 67
GOODRICH, Mr. bounty to 327, 366
GODDINGE, Rev. Samuel, certificate signed by 225

GRASS SEEDS, account of, on improved waſte Land 198
GREENHALGH, James, certificate ſigned 229

H.

HANMER, Sir Thomas, thanks to 339, 351
HAY, premium offered for making, in wet weather 34
Claim for making 226
Method deſcribed 227
HEIFER, account of one fed with parſneps 257, 259
HISTORICAL DRAWINGS, premium for 77
HONORARY premiums for Drawing 73, 74
HOPS, premium for deſtroying fly on 47
HYNAM, Mr. Robert, Gold Medal to 307, 367
his Letter to the Preſident ibid.

I.

INFIELD, explained 181
improved 182
INSECTS, a mode of deſtroying 278
IRON, FINE BAR, premium for 63
preſerving from ruſt, premium for 69

K.

KALI, for Barilla, premium for 101

KENT, Nathaniel, Esq. thanks to 119
Account of his Majesty's Farms at Windsor 119
Quantity of Land in 120
how divided 121
Motives for 123
Advantage of Sheep on 124
of Oxen 125
Oxen how managed on 126
KNIGHT, T. A. Esq. his Treatise mentioned 266
KNIGHTS, Miss, Silver Pallet to 302, 366
KNIGHTS, Miss, greater Silver Pallet to 302
Busts received from 303

L.

LAMBS, price of 199
LAMBE, Wm. certificate signed 165
LAND (see Arable)
Improving Waste 38
Gaining from the Sea 43
Lying waste, premium for improving 166
Account of 171
Rent of the Land 172
LANDSCAPES, premiums for 76
LARCH, premiums for raising 11
LAND lying waste, how divided 177
Hedges on described 178
Quantity of ditch made 179
State of, when improvements began 179
Draining, how necessary 191

LAND lying waſte, Crops on 192, 221
Manure, when applied 193
Courſe of Crops on 200
Expences attending the improvement of 205, 211, 219
Quantity of, improved 171, 224
LIESH, (M'Archibald, Silver Medal and Twenty Guineas to 355
LIGHTS in STAINED DRAWINGS, proceſs for producing 296
Manner of working 300

M.

MACHINE for raiſing Coals, &c. 90
Water 91
Making bricks ibid.
MALT DUST, uſe of, as Manure 232
MANUFACTURES, premiums for encouraging 83
MANURES, premiums for 40
Obſervations on 232
MASQUERIER, Mr. J. J. Silver Medallion to 364
MECHANICKS, premiums for Inventions in 88
Papers in 305
MEMBERS, Liſt of 379
MICKLE, George, certificate ſigned 159
Gives the account of Land in decimals 159
MIDDLETON, John, Eſq. Silver Medal to 231, 362
his obſervations on Manures 231
MILBOURNE, Mr. Henry, greater Silver Pallet to 364
MILL, premium for pariſh or family 89
Stones, premium for 95

MILL, erected by his Majesty for the benefit of the Poor 139
MILLS, premium for Gun-powder 93
MOORS, improving waste 41
MOSS LAND, account of improving 202
MUCILAGE, Modes of separating, from Oils 283
MURE, Samuel, bounty to 355, 367

N.

NATURAL HISTORY, premiums for 79
NICHOLSON, Mr. Francis, Twenty Guineas to 296, 366
NUTMEGS, premiums for 97

O.

OAKS, premium for raising 5, 6
OAK Timber, in compass forms 7
OIL, refining, premium for 58
Nut or Poppy, used with Varnish 292
OPIUM, premium for 70
ORCHARDS, premiums for planting 20
OSIERS, premiums for raising 15
Claim for 140
Names of various sorts 140, 142
OUTLINES, premiums for 75
OUTFIELD explained 181
improved 183
OXEN, how best harnessed 129
Different kinds of ibid.
Profit of 130

P.

PAGE, Thomas, Esq. Gold Medal to 140, 361
PAINT, substitute for basis of, premium for 65
PAPER from raw Vegetables 85
PARRY, Mr. C. H. Silver Medal to 364
PARSNEPS, premiums offered for 33
Papers on the uses of 256
PASSENGERS, premium for preventing injury to 93
PHILLIPS, John, Esq. certificate signed by 142
PIGMENT, Red, premium for 66
PLASTER Busts hardened by Wax 303
PLOUGH, Norfolk, recommended 134
POLITE ARTS, premiums in 73
Paper in 283
POOR, Labouring, premiums for improving condition of 50, 51
PORPOISES, premium for taking 89
Oil from 90
PROVISIONS, preserving, premium for 61
POTATOES, for feeding Cattle and Sheep 160
Cow fed with, worth of 162
Expence of raising 163
PRESENTS received 368

R.

RABBIT WARREN, account of Culture of 161
REWARDS bestowed 361
RHUBARB, premium for cultivating 35
RIGAUD, Mr. S. F. Gold Pallet to 365

ROBINSON, Mrs. M. R. Silver Medal to 364
ROCKS, premium for boring 94
ROOMS, premium for heating 96
ROOTS and HERBAGE, premiums for cultivating 31

S.

SCOTLAND, premium adjudged in 166
SCULPTURE, premium for 75
SEATON, Mr. William, premium to 160, 361
SEEDS, preſerving, premium for 53
SEED WHEAT, account of raiſing 153
SHELDRAKE, Mr. his Paper on Oils 283
SHEEP, premium for protecting 49
curing ill effects of Fly on 48
Advantages of 131
Manner of managing ibid.
Various modes of folding 132
SILK, premium for 83
Machine for carding ibid.
SMOKE, premium for deſtroying 56
Condenſing 57
SOAP-MAKERS Waſte, as Manure 234
SOMERVILLE, Thomas, certificate ſigned 215
SOIL of PRIVIES, a Manure 236
SOOT, uſe of, as Manure 233
SPHERES, method of turning 333
SPIRIT, premium for proof 60
STEAM, increaſing, premium for 62
STRAW, Bean, application of 153
SWEEPINGS of STREETS, a Manure 235

T.

TALBOT, Miss F. Silver Medal to 365
TAR, substitute for, premium for 71
TEETH of WHEELS, Machine for gauging 308
Calculations on ibid.
Table of Proportions for 316
Rule for 320
TIMBER, preventing Dry-rot in, premium for 63
TIMBER TREES, premiums for 19
Premiums for securing 24
TIN, refining Block, premium for 67
TIPPLES of HAY 227
TRANSIT INSTRUMENT, premium for 88
TREACLE, premium for separating Sugar from 54
TURNEPS, premiums for 30
Account of, on improved Waste Land 197
Claim for Culture of 240
Remarks on 246
Preparing Land for 247
Manures for 248
Sowing of 249
Drilling of 251
Mode of preserving 252

V.

VARIETY, a Term in orcharding, what 269
VETCHES, observations on 134
VINE, a remarkable one in Hampton-Court Garden 272
VEGETABLE FOOD, premiums for 30

W.

WAKEFIELD, Mr. Silver Medal to 226, 362
WATER, preſerving freſh, premium for 54
Purifying 55
Method of laying on upon Water-Wheels 339
WETHERS, fatted by Parſneps 260
WHALES, premium for taking 88
WHEAT, premiums, for comparative Culture of 27, 28
Machine for Dibbling 44
Account of raiſing Seed 153
Sown after Beans, accounts of 154
WHITE LEAD, premium for preparing 64
WICKS FOR CANDLES, premium for 85
WIRE-WORM, premium for deſtroying 46
WINDSOR PARK. (See Farm)

Y.

YEAST, premium for preſerving, or ſubſtitute for 69

Printed by W. and C. Spilſbury, Snowhill, London.

DIRECTIONS TO THE BOOKBINDER.

Place the Print of Dr. Templeman as Frontiſpiece to the Volume.

The two Plates of Mr. Hynam's Machine for gauging Cutters, to face page 325.

Mr. Simon Goodrichs's Eſcapement, to face page 333.

Mr. Featherſtonhaugh's Machine, to face page 338.

Sir Thomas Hanmer's Manner of laying Water on Water-Wheels, to face page 350.